INFLUENCE OF HOUSEHOLD INCOME POVERTY ON THE PERSISTENT POACHING ACTIVITIES IN BURUNGE WILDLIFE MANAGEMENT AREA IN BABATI DISTRICT, TANZANIA

BEATRICE MODEST

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2025

CERTIFICATION

The undersigned certifies that they have read and hereby recommends for acceptance by the Open University of Tanzania a dissertation titled: **"*Influence of Household Income Poverty on the Persistent Poaching Activities in Burunge Wildlife Management Area in Babati District, Tanzania",*** in partial fulfilment of the requirements for the Degree of Master of Arts in Natural Resources, Assessment and Management of the Open University of Tanzania.

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DECLARATION

I, **Beatrice Modest,** do hereby declare that this dissertation is my own original work and it has not been presented for a similar or any other award to any other University. It is hereby presented in fulfilment of the requirements for the Degree of the Master of Arts in Natural Resources Assessments and Management of The Open University of Tanzania.

…….

Signature

…….

Date

DEDICATION

This dissertation is dedicated to my lovely family

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ABSTRACT

This study aimed to investigate the influence of household income poverty on the persistent poaching activities in Burunge wildlife management area in Babati district, Tanzania. Data were collected from a sample size of 386 randomly selected respondents, where questionnaires were administered to heads of households, while in-depth interviews were conducted to purposively selected 22 key informants in the study area. Quantitative data was analysed by using both descriptive statistics and inferential statistics while the qualitative data were analysed through content analysis. The finding on the household monthly incomes among residents surrounding Burunge WMA reveals that 18.9% of households are living in extreme poverty, 14.2% are in moderate poverty, and 21.8% are vulnerable to poverty while 45.1% of households are categorized as non-poor. Further, the major reasons for poaching activities in Burunge WMA are bush meat for commercial purposes (46.7%), subsistence (38.3%) and traditional medicine (7.3%). The statistical analysis using the Chi-Square test showed a strong relationship between household income poverty levels and engagement in poaching activities ($\chi^2 = 33.452$, df = 3, $p<0.05$). The study concludes that income poverty, characterized by inadequate education, lack of alternative livelihoods, economic desperation, and financial pressure, significantly drives individuals to engage in poaching activities. The study recommends for provision of alternative livelihood opportunities and supporting sustainable agriculture programs among residents surrounding Burunge WMA.

***Keywords**: Household Income Poverty, Poaching Activities, Wildlife Management Area*

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LIST OF ABBREVIATIONS

AWF	African Wildlife Foundation
CBOs	Community Based Organizations
CITES	Convention on International Trade in Endangered Species of Flora and Fauna
DGO	District Game Officer
GCAs	Game Controlled Areas
GDP	Gross Domestic Product
IUCN	International Union for the Conservation of Nature
NGOs	Non-Government Organizations
PA	Protected Area
SEM	Structural Equation Model
SPSS	Statistical Package for Social Science
TANAPA	Tanzania Nationals Parks
TAWIRI	Tanzania Wildlife Research Institute
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
URT	United Republic of Tanzania
VGS	Village Game Scouts
WMAs	Wildlife Management Areas

CHAPTER ONE

INTRODUCTION

1.1 Chapter Overview

Chis chapter includes that background to the research problem, statement of the research problem, the general and specific objectives, research questions, significance, scope and organization of the study.

1.2 Background to the Research Problem

Throughout the world, millions of wild species and their products are illegally harvested, utilized, traded, exported, and imported (Roe *et al*., 2002; Janine *et al*., 2018; van Uhm *et al*., 2018; Mrosso *et al*., 2022). In recent decades, wildlife poaching, driven by the demand for bushmeat and trophies, has increasingly emerged as a major global crime (Kideghesho, 2016; Ripple *et al*., 2015; TRAFFIC, 2012). Large and charismatic wildlife species have been the primary targets, resulting in a significant decline in their populations (Kideghesho, 2019).

The World Wildlife Fund (WWF) reports that the global population of wild animals declined by 60% between 1970 and 2017 due to poaching (WWF, 2018). Statistics indicate that the most targeted regions for wildlife poaching include the rainforests of Brazil and Latin America, as well as China, India, and Africa, which are home to some of the world's most diverse and vibrant fauna (Giovanni, 2006). According to Rivesa (2016), poaching is driven by the high commercial value of animal parts such as ivory, fur, horns, organs, pelts, claws, and bones.

In Africa, illegal wildlife hunting for food and other purposes remains a widespread challenge (Davies & Brown, 2007; Ripple *et al*., 2016), with conservation scientists identifying various factors driving poaching (Lindsey *et al*., 2013). These factors include low agricultural productivity in rural areas (Agrawal & Redford, 2006; Brockington & Wilkie, 2015), rural poverty, and a lack of alternative livelihoods beyond subsistence hunting (Coad, 2007; Harrison *et al*., 2015). For many rural communities in Africa, subsistence agriculture serves as the primary means of livelihood (Davis *et al*., 2017). Consequently, poor agricultural productivity affects household food security and often leads to increased reliance on natural resources (Cawthorn & Hoffman, 2015). Additionally, the growing human population near conservation areas, coupled with rising living standards, has intensified pressure on wildlife through poaching and habitat destruction (Caro & Davenport, 2016). The preference for bushmeat, driven by its taste, affordability, and availability, has further contributed to its popularity over other sources of animal protein, such as livestock and fish (Ndibalema & Songorwa, 2007; Ordaz-Németh *et al*., 2017).

Poaching has detrimental effects on both wildlife and their habitats in various ways (Wilfred, 2012). Unlike regulated forms of hunting, such as trophy hunting, poaching employs both selective and indiscriminate methods, including firearms, wire snares, pitfalls, dogs, and fire (Mfunda & Røskaft, 2010; Lindsey *et al*., 2013). These practices result in the deaths of both target and non-target species (Coad, 2007; Lindsey *et al*., 2013), contributing to population declines and, in some cases, extinctions (Ginsberg & Milner-Gulland, 1994; Coad, 2007; Caro, 2008). Additionally, poaching can cause significant imbalances in wildlife sex ratios, often

leading to a disproportionate number of females in affected populations (Milner-Gulland *et al*., 2003; Setsaas *et al*., 2007; Marealle *et al*., 2010). This skewed ratio can reduce reproductive success and hinder population recovery (Gordon *et al*., 2004). For example, in the critically endangered saiga antelope (Saiga tatarica tatarica), an extreme female-biased population has been linked to reproductive collapse (Milner-Gulland *et al*., 2003). Moreover, poaching of key species such as elephants disrupts their movement patterns and home ranges (Goldenberg *et al*., 2018), which can further impact plant species composition and biodiversity. This is particularly significant as elephants play a crucial role in seed dispersal, influencing plant regeneration and ecosystem stability (Campos-Arceiz & Blake, 2011).

Wildlife sector in Tanzania is facing various challenges, the top being wildlife poaching (Kideghesho, 2016). Wildlife poaching activities cater for both subsistence and commercial purposes. Bush meat poaching of certain species is particularly critical in Africa, and especially East Africa, where the link between the decline of wildlife population and hunting has been more extensively than in other parts of Africa (Brashares *et al.,* 2001; Robinson and Bennett, 2000). In many domestic and foreign marketplaces, the main variation of usage of wildlife products is food, monetary values, traditional remedies, myths, and beliefs (Wong 2017; Erosion 2014; and Loibooki *et al.,* 2002). According to Bennett (2014) and URT (2009), any part of a wild animal's body, such as meat, egg, ivory, horn, claw, tooth, hoof, bone, hair, feather, skin or full body is referred as the wildlife product. According to Nijman *et al.* (2019), most wildlife products are marketed and used in various ways. Meat is used as food; claws, teeth, skin and bones are used as ornaments; while fat

and other parts of the animal are useful for witchcraft and traditional medicine purposes.

In Tanzania, studies have recognized the degree, forces influencing poaching and the resultant effects of poaching activities. These studies acknowledge the severity of poaching as a main problem facing conservation with far-reaching ecological, social, economic and security consequences (Jambiya, *et al.*, 2007). The identified factors for wildlife poaching include poverty, cultural reasons, immorality and corruption, high opportunity cost of conservation, inadequate conservation budget and political instability associated with refugee influx from other countries (Kideghesho, 2016). The main forces for subsistence poaching include household's poverty and requirement for dietary needs. High market demand coupled with high economic returns from illegal trading of wildlife products motivates the commercial poaching. Both subsistence and commercial poaching are linked to an affected reduction of wildlife population and local extinction of wildlife species in various parts of Tanzania (Loibooki, 2002). The established effects include loss of biodiversity, loss of national credibility, insecurity and financial losses (Lotter and Clark, 2014).

According to Kideghesho (2016), wildlife poaching is increasing at a shocking rate to the point of extinguishing some species of wildlife resources in Tanzania. The poaching problem has been accelerated by the perception that every villager bordering the protected area is a potential poacher of the protected area (Skinner, 2014). Like other Wildlife Management Areas in Tanzania, Burunge WMA is facing the challenge of poaching activities by the surrounding communities.

Despite the implementation of numerous strategies aimed at curbing poaching, such as community-based conservation (CBC) initiatives, special operations conducted in collaboration with armed forces, and the enforcement of wildlife protection laws, poaching activities in protected areas, including Wildlife Management Areas (WMAs), continue to rise (Kideghesho, 2019). Community-based conservation is designed to involve local communities in wildlife protection by sharing conservation benefits and fostering a sense of ownership. Special operations with armed forces focus on heightened surveillance and intervention efforts to capture poachers and deter illegal hunting. Legal enforcement includes stringent penalties for poaching offenses and the regulation of wildlife trade. However, these measures have been insufficient in fully addressing the root causes of poaching, such as poverty, weak governance, and high demand for wildlife products, which continue to fuel illegal activities in protected areas (Kideghesho, 2019).

1.3 Statement of Research Problem

Wildlife poaching activities have been a common problem for most Wildlife Management Areas in Tanzania including Burunge WMA. The increasing rate of poaching activities in most WMAs is associated with the level of income poverty among surrounding communities (Kideghesho, 2019; Harrison *et al*., 2015; Lindsey *et al.*, 2013). Households' income poverty is often linked to subsistence hunting and illegal wildlife trade (Kideghesho, 2019). However, the level of households' income poverty and its influence on the persistence of poaching activities among residents living around Burunge WMA remains not well documented. Thus, this study aimed to fill this knowledge gap by investigating the influence of income poverty of

surrounding communities on the persistent wildlife poaching activities in Burunge WMA in Babati district. The motivation for undertaking this study stems from the need to address the interconnected challenges of wildlife poaching and income poverty in Burunge WMA. Understanding the specific influence of income poverty on poaching activities can inform targeted interventions and policy measures to promote conservation and improve livelihoods in the study area.

1.4 Study Objectives

1.4.1 General Objective

The main objective of this study was to investigate the influence of household income poverty on the persistent poaching activities in Burunge wildlife management area in Babati district.

1.4.2 Specific Objectives

i. To examine the level of household income poverty among residents surrounding Burunge WMA
ii. To examine the reasons for wildlife poaching activities in Burunge WMA
iii. To examine the relationship between household income poverty and poaching activities in Burunge WMA

1.5 Research Questions

i. What is the level of household income poverty among residents surrounding Burunge WMA?
ii. What are the reasons for wildlife poaching activities in Burunge WMA?

iii. What is the relationship between household income poverty and poaching activities in Burunge WMA?

1.6 Significance of the Study

This study provides a better understanding regarding the influence of household income poverty on the persistent poaching activities in Burunge Wildlife Management Area in Babati District. Understanding the main driver of poaching (household income poverty) is crucial if practical solutions of the challenge are to be sought. Consequently, addressing poverty and provision of alternative livelihood strategies may be an appropriate intervention against food and income poverty among the communities living around the protected areas. The study findings contribute to the existing knowledge base and will be a valuable reference for future research in the conservation of natural resources. The findings are useful for management, conservationists and policy makers in addressing the persistent poaching activities facing many protected areas in the country. Research-based findings are the bases for recommending appropriate strategies and informing policy actions to address the existing and potential conservation challenges.

1.7 Scope the Study

Regardless of existence of many factors influencing wildlife poaching activities, the study focused on the influence of household income poverty on the persistent poaching activities in Burunge Wildlife Management Area in Babati District. As a case study, the study concentrated on the single Burunge Wildlife Management Area in the study area.

1.8. Organisation of the Study

This dissertation is organized into five chapters. Chapter one outlines the background to the research problem, statement of research problem, research objectives, scope and significance of the study. Chapter two focuses on the literature review, providing an overview of relevant theoretical and empirical review, research gap and conceptual framework for this study. Chapter three explains the research methodology, detailing the approaches and techniques deployed in this study. Chapter four presents and discusses the findings, while chapter five offers a summary of the findings, along with conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Chapter Overview

This chapter presents the literature review for this study. It describes the definition of key terms and concepts, the theoretical literature review, empirical literature review, research gap and conceptual framework for the study.

2.2 Conceptualization of Key Terms

2.2.1 Wildlife

Wildlife refers to undomesticated animal species, the dissertation has come to include all organisms that grow or live wild in an area without being introduced by humans (Smith *et al.*, 20212). According to Usher (1986), wildlife encompasses a vast array of non-domesticated organisms, including mammals like lions and elephants, birds such as eagles and parrots, reptiles like snakes and crocodiles, amphibians such as frogs and toads, and diverse fish species. These organisms inhabit various natural environments, from forests and grasslands to oceans and freshwater ecosystems, playing crucial roles in maintaining ecological balance and biodiversity. In this study, wildlife is defined as non-domesticated animal species including all flora and fauna that evolve or exist in the wild in an environment free of human intervention.

2.2.2 Poaching

Poaching is the illegal hunting, capturing, and often killing of wild animals (Bennett, 2014). It is done for a number of reasons including; desire for rare animal products

such as ivory, fur, organs, skin, bones, or teeth and claiming the land for human use (Bennett, 2014). According to Britannica (2024), poaching is the illegal hunting or capturing of wild animals, usually associated with land use rights. In the context of this study, poaching refers to the illegal hunting, capturing, or killing of wildlife, usually for commercial gain or personal use. It often involves targeting endangered or protected species, such as elephants for ivory, rhinoceroses for their horns, or tigers for their skins.

2.2.3 Households

A household is defined by the U.S. Census Bureau as all the people who occupy a single housing unit, regardless of their relationship to one another. For the purpose of this study, a household refers to a basic social unit consisting of individuals living together and sharing common resources, such as a residence, food, finances, and daily activities. Household members can include family members, relatives, or unrelated individuals who live together and contribute to the functioning of the household.

2.2.4 Household’s Income Poverty

According to Mabughi & Selim, (2006), income poverty is lack of access to economic resources (income) to satisfy basic material needs. A person (or household) is considered poor if the person's (or household's) income cannot acquire the basket of goods and services used to define a threshold for poverty. Poverty can be categorized into two types: absolute poverty and relative poverty. Absolute poverty is when household income is below a certain level. This makes it impossible

for the person or family to meet basic needs of life including food, shelter, safe drinking water, education, healthcare, etc. (World Bank, 2021). Relative poverty is when households receive 50% less than average household incomes. So they do have some money but still not enough money to afford anything above the basics (Ames *et al.*, 2001). In the context of this study, income poverty refers to a situation in which individuals or households have insufficient income to meet their basic needs and sustain a decent standard of living. It is typically measured based on income levels relative to a specified poverty line in a given society. Income poverty can manifest in various forms, including inadequate access to food, shelter, healthcare, education, and other essential services.

2.2.5 Wildlife Management Area (WMA)

This is a village land set aside for the conservation of wildlife with the purpose of enabling local communities in the participation of protection and utilization of wildlife resources (Stolla, 2005). According to WWF (2005), a Wildlife Management Area (WMA) is a designated area of land set aside for the conservation and sustainable management of wildlife and their habitats. WMAs are typically established by villages, conservation organizations, or private landowners with the goal of protecting biodiversity, promoting ecological balance, and providing opportunities for recreational activities such as hunting, fishing, bird-watching, and nature conservation. In this study, WMA is referred to a form of the Community-Based Natural Resources Management (CBNRM) approach that aims at integrating and fostering sustainable rural livelihoods in line with improving wildlife conservation.

2.3 Theoretical Literature Review

The study was guided by the Theory of Planned Behaviour (TPB) developed by Ajzen (1991). The theory is a modification of the Theory of Reasoned Action (TRA) that expand and add the factor of perceived behavioural control in TPB. According to the theory, behaviours are influenced by intentions, which are determined by three factors: attitudes, subjective norms, and perceived behavioural control. While the theory provides a framework for understanding and predicting human behaviour across various contexts, including health behaviours, environmental actions, and decision-making processes, in practice, there is no straightforward effect of behavioural intention on actual behaviour. The Theory of Planned Behaviour (TPB) is instrumental in examining the reasons for wildlife poaching activities in Burunge Wildlife Management Area (WMA). Through this theoretical framework, researcher investigated the attitudes of poachers towards poaching reasons, including; economic status (income level) and how they influence poaching activities in the WMA.

2.4 Empirical Literature Review

2.4.1 Level of Household Poverty among Local Community

The World Bank (2021) often categorizes individuals' income poverty levels based on income thresholds and multidimensional poverty indicators. While specific income thresholds can vary by country and context, the general categories are as follows: extreme poverty including individuals living on less than $1.90 per person per day, which equates to approximately 153,900 TZS per person per month (exchange rate of 1 USD = 2,700 TZS). Moderate poverty covers those individuals living on between $1.90 and $3.20 per person per day, or 153,900 to 259,200 TZS

per person per month. Vulnerable to poverty refers to individuals earning between $3.20 and $5.50 per person per day, translating to 259,200 to 445,500 TZS per person per month. Finally, non-poor individuals earn more than $5.50 per person per day, or over 445,500 TZS per person per month, allowing them to maintain a higher standard of living with better access to essential services. These categories provide insight into the economic status of households and are essential for poverty assessment, intervention design, and monitoring economic progress.

According to the World Bank (2020), poverty is measured by the international poverty line of $1.90 per day, and as of 2020, approximately 9.2% of the world's population lived in extreme poverty. However, in many local communities, especially in sub-Saharan Africa, this figure is significantly higher. In Tanzania, household poverty levels have been studied extensively, and findings show that a significant proportion of the rural population lives below the poverty line. The Tanzania National Bureau of Statistics (2019) reports that 28.2% of the population lives in poverty, with a higher concentration in rural areas. Factors contributing to this high level of poverty include low agricultural productivity, insufficient access to credit, lack of infrastructure, and limited educational opportunities.

Many rural areas with abundant wildlife population are characterized by lack of economic activity or employment opportunities. Illicit trade and organized crime often enrich local people, and illegal hunting and the sale of bushmeat provides an opportunity for quick cash income for people with few alternative livelihood options (Lindsey *et al.,* 2015). A study by Mojo *et al.,* (2020) in Maasai Mara National

Reserve in Kenya found that, based on Foster Greer Thorbecke poverty indices, 59% of protected area-adjacent and 66% of distant households lived below poverty line of USD 1.90 per day. On the other hand, 76% of protected area-adjacent and 85% of distant households lived below poverty line of USD 3.10 per day.

The study by Keane *et al.* (2020) examined the impact of Tanzania's wildlife management areas on household wealth. The study categorized the study villages' populations as predominantly poor around the time of WMA establishment. The largest number of households were placed in the wealth category of Poor, followed by Very poor, Normal, and Rich. Households from villages within WMAs were slightly wealthier than those from matched non-WMA villages. In terms of interventions, Barrett and Carter (2013) emphasize the importance of social safety nets in reducing household poverty. Their research shows that programs such as cash transfers, food assistance, and microcredit can significantly reduce poverty levels by providing households with the resources needed to invest in income-generating activities and improve their living conditions. However, these interventions must be tailored to the specific needs of the local communities and be accompanied by policies that address structural barriers to poverty reduction.

2.4.2 Reasons for Poaching Activities

Wildlife poaching for food and other uses remains a prevalent issue in Africa (Davies & Brown, 2007; Ripple *et al*., 2016). Conservation scientists have identified several factors contributing to poaching (e.g., Lindsey *et al*., 2013), including low agricultural productivity in rural areas (Agrawal & Redford, 2006; Brockington &

Wilkie, 2015), rural poverty, and a lack of alternative livelihoods beyond subsistence hunting (Coad, 2007; Harrison *et al*., 2015). Subsistence agriculture is the primary source of livelihood for many rural communities in Africa (Davis *et al*., 2017). However, low productivity in this sector affects household food security, often leading to increased reliance on natural resources (Cawthorn & Hoffman, 2015). Additionally, the expanding human population near conservation areas, coupled with rising living standards, has heightened pressure on wildlife through increased poaching and habitat degradation (Caro & Davenport, 2016). The preference for bushmeat, driven by its taste, affordability, and availability, has further contributed to its popularity over other sources of animal protein, such as livestock and fish (Ndibalema & Songorwa, 2007; Ordaz-Németh *et al*., 2017).

The study by Knapp (2012) examined the reasons for poaching in regions where local communities are economically disadvantaged and depend on wildlife for subsistence. It found that poaching often occurs as a means of securing food and income for survival. Similarly, the study by Nuno and St. John (2015) analyzed poaching activities in areas with limited alternative livelihoods and demonstrated that economic desperation plays a significant role in the exploitation of natural resources as a solution to household poverty.

In a different context, the study by Wilfred and MacColl (2011) explored commercial poaching, particularly focusing on the global black market for wildlife products like ivory and rhino horns. It revealed how international demand, especially in Asian markets, incentivizes poaching by offering lucrative opportunities for local

individuals and organized crime groups. The research by Milliken and Shaw (2012) further examined how commercial poaching syndicates exploit local poachers by providing financial rewards for killing endangered species in high-poverty areas.

Cultural factors were explored in the study by Bitanyi *et al*. (2012), which investigated poaching practices in Tanzanian communities where bushmeat hunting is seen as a traditional activity passed down through generations. Poaching for cultural reasons is often associated with rituals, medicinal purposes, or community ceremonies. Additionally, Lindsey *et al*. (2013) examined the cultural demand for wildlife products in African societies, noting that they are often used in traditional healing practices or as symbols of status, thereby perpetuating the demand for illegal hunting.

2.4.3 Relationship between Household Income Poverty and Poaching Activities

Poverty is frequently cited as a primary driver of illegal wildlife hunting, as economically disadvantaged individuals often resort to poaching to meet their basic material needs (Mackenzie *et al*., 2011; Twinamatsiko *et al*., 2014; IUCN *et al*., 2015). For instance, a study conducted by Twinamatsiko *et al*. (2014) on Bwindi National Park in Uganda found that individuals arrested for unauthorized activities within the park were significantly poorer and more likely to reside closer to the park and farther from trading centers than others. Similarly, recent research on the relationship between poverty and wildlife crime in Uganda highlighted poverty alleviation as one of the most effective strategies for curbing illegal wildlife hunting (Harrison *et al*., 2015). The notion that illegal hunting is driven by material

deprivation is widely echoed in influential policy discussions. For example, the International Conservation Caucus Foundation (ICCF), which includes one-third of the U.S. Congress as members, has asserted that extreme poverty in Africa not only fuels illegal wildlife hunting but also contributes to radicalization (ICCF, 2014). A similar perspective was shared during the high-level meeting on illegal wildlife trade hosted by the U.K. Government in May 2013 (Government of the United Kingdom, 2013).

Caro *et al*. (2013) argue that poaching leads to income loss and jeopardizes the employment of workers in related sectors. Additionally, wildlife poaching has been linked to disease outbreaks, such as Ebola in the Central African Republic and the Democratic Republic of Congo, due to human contact with and consumption of poached meat sold on illegal wildlife markets. Similarly, Severe Acute Respiratory Syndrome (SARS) outbreaks in China and Hong Kong have also been associated with wildlife trade (Gordon *et al*., 1967; Le Guenno *et al*., 1995; Peiris *et al*., 2003). Kasnoff (2016) highlights the economic toll of poaching, estimating that it costs African nations approximately USD $25 million annually in lost tourism revenue. Meru (2015), who asserts that poaching threatens up to 3.8 million tourism-related jobs across Africa, reinforces this view.

2.5 Research Gap

The reviewed literature has found that many studies on factors affecting poaching activities have been conducted elsewhere (IUCN *et al*., 2015; Lindsey *et al*., 2015; Ripple *et al.*, 2016; Davis *et al.*, 2017). However, within the scope of literature

search by the researcher, there was a research gap of local studies regarding the influence of household income poverty on the persistent poaching activities in Burunge wildlife management areas (WMAs) in Tanzania. This study aimed to fill the identified research gap by examining the influence of household income poverty on the persistent poaching activities in Burunge wildlife management area in Babati district. This study is important to provide a better understanding on how household income poverty drives local communities towards poaching activities in Burunge WMA. By addressing income, poverty and provision of alternative livelihood strategies may be an appropriate intervention against food, income poverty and poaching activities among the communities living around the protected areas.

2.6 Conceptual Framework

The conceptual framework for this study (Figure 2.1) outlines the relationship between income poverty (independent variable) and poaching activities (dependent variable). Income poverty within households is believed to directly contribute to the increase in poaching activities, as individuals often resort to hunting wildlife for various purposes, including subsistence, commercial trade, traditional medicine, ornaments, and other wildlife products.

This connection between income poverty and poaching is primarily driven by economic desperation, where individuals face limited income-generating opportunities and are compelled to exploit natural resources to meet their basic needs. The lack of alternative livelihoods further exacerbates this issue, as people in rural communities may have few, if any, viable options for employment or income

diversification. Additionally, inadequate education and skills restrict individuals from seeking formal employment or starting small businesses, perpetuating a dependence on wildlife and other natural resources for survival. Social norms and community practices in some areas may also support or condone poaching as a cultural tradition, making it a common practice despite legal restrictions.

Debt and financial pressure force some households to engage in illegal activities such as poaching to alleviate their financial burdens. Furthermore, limited access to markets can make it difficult for individuals to sell legal goods or services, pushing them toward illegal wildlife trade, which offers immediate financial rewards. Lastly, health and medical expenses can be overwhelming for impoverished households, driving them to engage in poaching as a means to afford healthcare costs, creating a vicious cycle of poverty and illegal activities. The conceptual framework was developed through theoretical review.

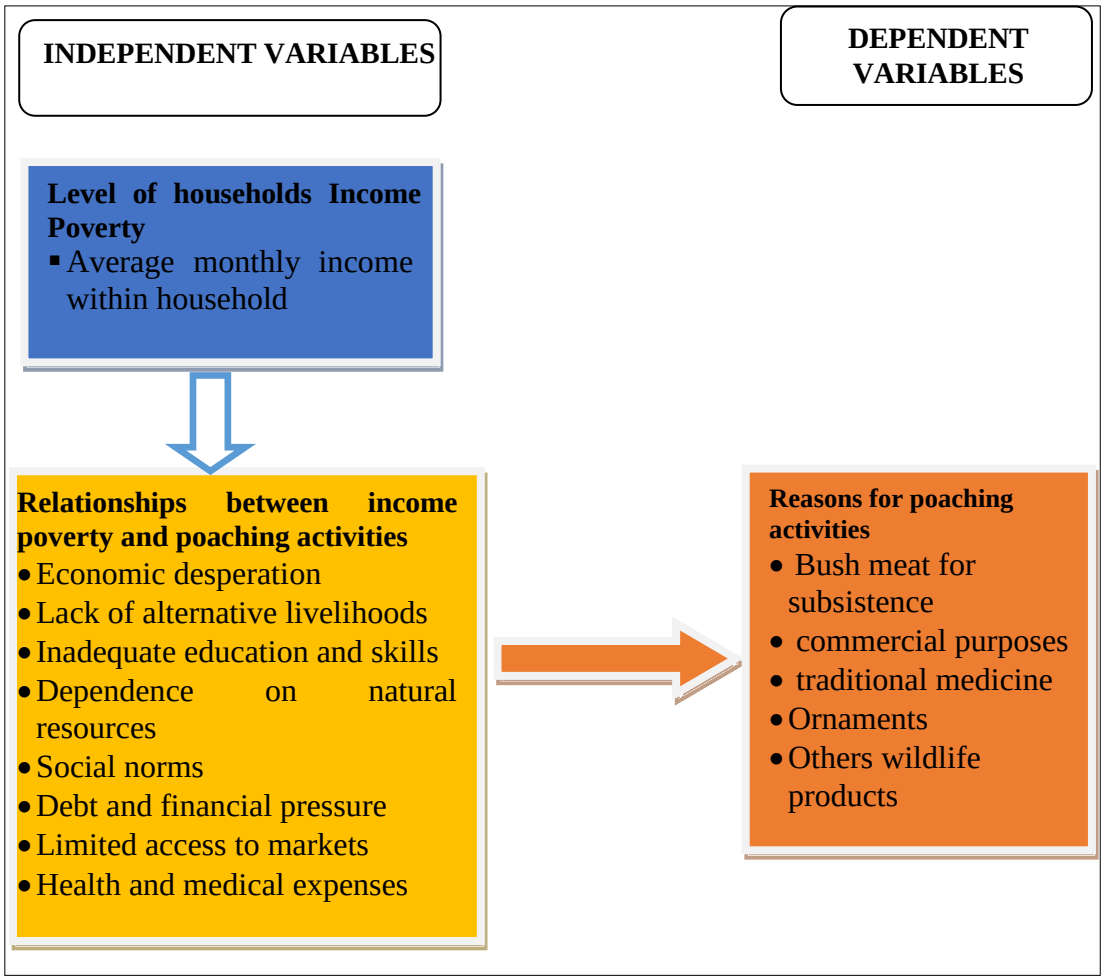

Figure 2.1: Conceptual Framework for this Study

Source: Researcher's Construct from Theorical Review (2023)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Chapter Overview

This chapter presents the research methodology adopted in this study. It describes the study area, the study design, population, sample size and sampling procedures. Further, the chapter presents the types and sources of data, data collection methods and tools, measurement of variables, validity and reliability issues, data analysis and ethical considerations.

3.2 Study Design

The study adopted a case study design to provide an in-depth analysis of the influence of household income poverty on poaching activities. This design was selected to allow a detailed investigation of the Burunge Wildlife Management Area in Babati District, focusing on how the household income poverty influence poaching activities in the area. By concentrating on this single case, the study aimed to gather comprehensive and context-specific insights, which could inform strategies to mitigate poaching and enhance wildlife conservation efforts.

3.3. Research Approach

The study adopted a mixed quantitative and qualitative research approaches. This approach generated both quantitative and qualitative data which allowed for data complementarity (Creswell, 2018). The justification of the mixed research approach is based on its ability to integrate multiple data methods and sources to generate both quantitative and qualitative data that allowed for data triangulation and

complementarity (Sekaran and Bougie, 2016; Lund, 2012; Saunders *et al*., 2012). Data triangulation in a mixed research methods study is generally accepted as a strategy for validating results obtained with the individual method (Maxwell, 2016; Watson, 2015; Bryman, 2012; Bergman, 2008).

3.4 The Study Area

This study was conducted in Burunge WMA, which is located in Babati district, Manyara region, Tanzania. It is located between latitudes 4.00^0S and 3.30^0S and longitudes 35.30^0E and 36.00^0E. Burunge WMA covers 283 km^2 in Babati district and forms a wildlife corridor between Tarangire and Manyara National Parks (Sulle, Lekaita, & Nelson, 2011). The Great East African Rift Valley Escarpment is visible from all angles within Burunge WMA, which includes land from 10 villages with a total of 10,891 households (BDC, 2022). The Burunge WMA is surrounded by diverse ethnic groups such as the Mbugwe, Barbaig, Maasai, Iraqw, and others (Bluwstein *et al.,* 2016). The most common livelihood activity for villages adjacent to Burunge WMA is livestock keeping and small-scale farming. About 95% of the inhabitants primarily depend on agriculture. Farmers mainly grow maize and beans for subsistence, and rice, sesame and cotton as a source of income (Sachedina, 2008).

Burunge was one of the first nine pilot WMAs officially launched in 2003 and among the first to gain official status in 2006 (U.S. Agency for International Development [USAID], 2013; World Wide Fund [WWF], 2014; Kicheleri *et al.,* 2018, Moyo *et al.,* 2017). The rationale for selecting Burunge WMA as the study area is due to its high importance to Tanzania's protected area network as a wildlife

corridor (USAID, 2013) linking Tarangire National Park, Lake Manyara National Park, Manyara Ranch, and the Ngorongoro Conservation Area (WWF, 2014). It is also flaunted as one of the best-managed WMAs (African Wildlife Foundation, 2013) and among the most economically successful because it generates the highest revenues of all WMAs in Tanzania (Veit, 2010). The map showing Burunge WMA and the surrounding villages (Figure 3.1.

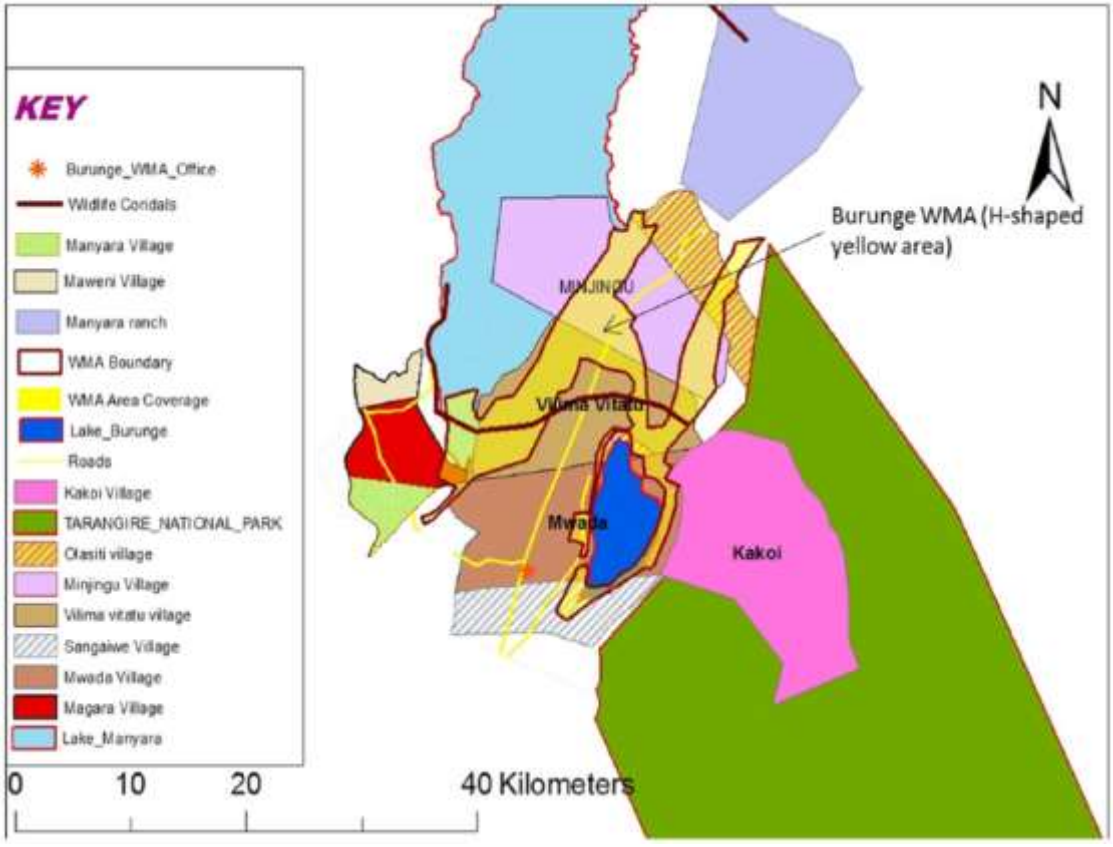

Figure 3.1: Burunge WMA and the surrounding Villages

Source: Burunge Wildlife Management Area Authorised Association, 2020

3.5 Study Population

According to Babati District Council (2023), Burunge WMA is surrounded by 10 villages with a total of 10,891 households as follows: Manyara (1,081), Magara

(1,343), Maweni (1,195), Vilima Vitatu (1,249), Minjingu (1,008), Kakoi (805), Olasiti (1,370), Ngoley (698), Mwada (1,200) and Sangaiwe (942). The study population includes the 10 villages forming the Burunge WMA, Babati district Wildlife officer (1), Burunge WMA leaders, Village Game Scouts (VGS), village government leaders and NGOs / CBOs in the study area.

3.6 Sample Size and Sampling Procedures

Both probability sampling (simple random sampling (SRS)) and probability proportional to size sampling (PPSS), and non-probability (purposive sampling) procedures were applied in this study. Given the study population of 10,891 households, 95% confidence level, 5% margin of error, the sample size was calculated to be 386 households according to the statistical formula given by Yamane (1967).

$$n = \frac{N}{1 + N(e^2)}$$

Where:

n – Sample size

N–Population size

e- Estimated sampling error

$$n = \frac{10{,}891}{1 + 10{,}891\ (0.05)^2} = 386$$

Therefore, total sample size estimation for this study was 386 households

The researcher selected the representative number of villages from the total number of 10 villages in the study area. According to Singh and Masuku (2011) and Nardi (2003), the ideal sample size can range between 10% - 30% of the target population. In this study, a sampling ratio of 30% of total number of 10 villages was considered to be reasonable, adequate and representative sample of study villages. Simple random sampling (SRS) was adopted to the select the representative sample of three (3) villages from the total number of 10 villages bordering Burunge WMA. The random sample of villages generated three villages, namely, Vilima Vitatu, Minjingu and Kakoi.

Then, a sample of 386 households was selected by using probability proportional to size (PPS) sampling method from the randomly selected three villages bordering Burunge WMA. The sample of households in each study village was randomly selected from the register of household proportional to the total number of population in the respective study village as shown in Table 3.1.

Table 3.1: Sampling Matrix of Households in each Village

Villages	Population	Sample
Vilima Vitatu	1,249	157
Minjingu	1,008	127
Kakoi	805	102
Total	**3,062**	**386**

Source: Researcher (2023)

Further, simple random sampling was applied to select the representative sample of households in each village for data collection. The village register of households in each of the three selected villages was used as a sampling frame. The researcher used

smartphone installed with *Random Number Generator Plus* App (Random AppsInc) to generate random numbers for the required sample size of households in each village. The generated random numbers for each selected village were matched against the serial numbers to get the names of households for administering questionnaire in the respective village. The justification of using probability sampling procedures is to ensure that each village and household bordering Burunge WMA had an equal chance of selection in this study and thus reducing the selection bias. These sampling techniques enabled the findings of this study to be more representative and generalizable to the study population (Creswell, 2018; Leavy, 2017; Sekaran and Bougie, 2016; Creswell, 2014; Saunders *et al.*, 2012; Creswell, 2009; Saunders *et al.*, 2007 & Kothari, 2004).

On the other hand, purposive sampling technique was adopted to selected key informants for conducting in-depth interviews. The potential keys informants were Babati District Wildlife Officer (1), Burunge WMA leaders (3), village chairmen (3), village executive officers (3), Village Game Scouts (VGS) (3), NGOs / CBOs (3) in the study area. These key informants were representatively selected based on their roles/positions, knowledge, skills, experience and capacity to provide the required information in this study. Further, with the assistance of the village leaders and VGS, the researcher sampled six (6) retired poachers for conducting an in-depth interview. The summary of overall sampling categories of the respondents is provided in Table 3.2.

Table 3.2: Summary of Overall Sampling Matrix for categories of respondents

Categories	Population	Sampling Procedure	Sample
Households	10,891	Simple random sampling	386
Babati District Wildlife Officer	1	Purposive sampling	1
Village Chairmen	10	Purposive sampling	3
Village Executive Officers	10	Purposive sampling	3
Burunge WMA leaders	N/A	Purposive sampling	3
Village Game Scouts (VGS)	N/A	Purposive sampling	3
NGOs / CBOs	N/A	Purposive sampling	3
Experienced poachers	N/A	Purposive sampling	6
Total			**408**

Source: Researcher (2023)

3.7 Types and Sources of Data

Both quantitative and qualitative data were collected from primary and secondary sources. Primary data were collected mainly by carrying out households' survey and conducting interviews to the randomly and purposively selected respondents respectively. The secondary data were collected through documentary review of official reports, national statistics and publications.

3.8 Data Collection Methods

3.8.1 Questionnaire

The researcher administered questionnaire (Appendix 1) to the randomly selected 386 heads of households in the selected three villages as follows: Vilima Vitatu (157), Minjingu (127) and Kakoi (102). The number of households in each study village was selected randomly using random numbers from the register of households in each of the three selected villages. The village leaders assisted the researcher in identifying randomly selected households and facilitated the administration of questionnaires to the household heads. The researcher ensured that the response rate

100% was reached by replacing any non-response with another qualified respondent from the sampling frame of households. The closed-ended questions collected mostly quantitative data while the open-ended questions enabled the respondents to gather more detailed qualitative information on issues that could not be given on closed - ended questions. The questionnaires essentially examined the level of household's income poverty, relationship between household income poverty and poaching activities, and reasons for poaching activities in Burunge WMA. The justification of using a questionnaire for data collection is due to its relative advantages such as the ability of collecting large amount of data from many respondents in a short period of time, standardization of questions across respondents, data analysing at a relatively higher speed and cost-effectiveness (Creswell, 2018).

3.8.2 Interview

The Interview Guide was prepared (Appendix 2), to conduct in-depth interviews to the purposively selected 16 key informants, namely, Babati District Wildlife Officer, Burunge WMA leaders (3), village chairmen (3), village executive officers (3), Village Game Scouts (VGS) (3), NGOs / CBOs (3) in the study area. Principally, the questions in the interview guide focused on assessing the level of household's income poverty, relationship between household income poverty and poaching activities, and reasons for poaching activities in Burunge WMA. Further, the researcher conducted in-depth sample interviews with six (6) experienced poachers to share their experiences in poaching activities in the study area. The rationale of using interview guide in this study is due to its ability to collect detailed and in-depth information, capture verbal and non-verbal ques, emotions and behaviours, and

explores research subjects' opinions, experiences and phenomenon (Cohen *et al.*, 2005).

3.8.3 Documentary Review

The research conducted a documentary review of various secondary sources including WMA official reports, national statistics and publications. Specifically, the number of poaching activities and poached animals in Burunge WMA from 2019 – 2023 were collected from Burunge WMA office to gain the insight on the magnitude of the problem. The rationale of collecting secondary data is based on its usefulness in providing background information on the subject; establishing the gaps and deficiencies; complementing primary data and show how the present study relates to existing research (Goodwin, 2012).

3.9 Measurement of Variables

The study assessed independent and dependent variables as indicated in the conceptual framework of this study. These variables include household’s income poverty, relationships between income poverty and poaching activities, and reasons for poaching activities poaching activities. These variables were measured as shown in Table 3.3.

Table 3.3: Measurement of Variables

Variable construct	Variable indicators	Measurement scale	Sources
Level of household's income poverty	Household income in TZS / month	Numerical	OECD (2022)
Relationships between income poverty and poaching activities	This will be measured by indicators such as economic desperation, lack of alternative livelihoods, inadequate education and skills, dependence on natural resources, social norms, debt and financial pressure, limited access to markets, and health and medical expenses	5-point Likert scale	Lotter and Clark, (2014).
Reasons for poaching activities	Poaching of bush meat for subsistence, bush meat for commercial, poaching for traditional medicine, ornaments and other wildlife products	5-point Likert scale	Wong, (2017)

Source: Researcher (2023)

3.10 Validity and Reliability of Data Collection Tools

3.10.1 Validity

Validity refers to the extent to which a research instrument, test, or measurement accurately measures what it is intended to measure. It reflects the degree to which the results or conclusions of a study are truthful and well-founded (Creswell, 2018). The researcher ensured content and construct validity of the research tools (Likert questionnaires and Interview guide) are achieved in this study. The researcher made sure that the tools contain list of questions that are well formulated to answer the research questions and the research questions are properly aligned to the intended research objectives. The data collection tools were also revised and reviewed by expert reviewers so as to enhance their validity. Content validity was assessed by the

panel of experts, including supervisors who were requested to review the set of questions in the research tools to ascertain their adequate coverage to this study (Bryman, 2006). The rationale of assessing the content validity is to evaluate the accuracy of a tool - the extent to which the tools, in this case the measurement questions in the questionnaire and interview guide, provides adequate coverage of the research questions (Saunders *et al.,* 2012; Babbie, 2013). Likewise, construct validity was assessed by panel of experts to ascertain whether the tools actually measures what the researcher intended them to measure; their clarity, meaningfulness, relevancy and usefulness (Saunders *et al.,* 2012; Bloomberg *et al.,* 2008).

3.10.2 Reliability

Reliability refers to the consistency or stability of a measurement or research instrument over time. It indicates the extent to which the results of a study, test, or measurement can be reproduced under similar conditions (Creswell, 2018). To ensure reliability in this study, the researcher conducted pilot / pre-testing of the data collection tool. The purpose of testing reliability is to assess the internal consistency of a measurement (Malhotra and Peterson, 2006; Field, 2009).

3.11 Data Analysis

The quantitative data were analysed by using both descriptive and inferential statistics through SPSS *version* 26 statistics software. The respondents' demographic information was summarized by using descriptive statistics such as frequency and percentage. The level of household's income poverty and main wildlife poaching

activities were summarized in descriptive statistics such as percentage and presented in graphs. Chi-square test through SPSS was used to test the association between independent variable and dependent variable.

Content method was adopted for analysis of qualitative data collected from in-depth interviews. Content analysis started with familiarization with the qualitative data, where the researcher thoroughly examined the content of the interview to gain an initial understanding of the collected information. This was followed by transcription of the audio clips to ensure all relevant information was captured in written form. Next, the researcher identified key themes within the data. A coding framework was developed based on these themes, and the content was systematically coded according to predefined rules. Coding involved assigning labels to segments of data that correspond to specific themes. Then the researcher interpreted the coded data, identifying relationships that aligned with the research objectives. The final stage involved summarizing and reporting the findings as texts under each relevant objective.

3.12 Research Ethics

The researcher adhered to all research ethics in conducting this study. The researcher ensured that she obtained research clearance (Appendix 3) form Open University and introduction letter (Appendix 4) from Babati District Council to facilitate data collection process at Burunge WMA and selected villages. Further, all participants in this study were informed about their research rights including the right to be provided adequate information about this study, informed consent before

participating in this study, voluntary participation in the study, free withdraw from the study at any time, protection and confidentiality of the information given by the participants.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Chapter Overview

This chapter presents the results and discussion of the findings, organized according to the specific objectives of the study. It covers the level of household income poverty among residents surrounding Burunge WMA, the reasons behind wildlife poaching activities, and the relationship between household income poverty and poaching activities in Burunge WMA. Additionally, the findings of this study were compared with those from previous similar studies.

4.2. Socio-economic Characteristics of Respondents

A total 386 respondents were distributed among three study villages: Vilima Vitatu, Minjingu, and Kakoi. Vilima Vitatu had the highest representation with 157 respondents, making up 40.7% of the sample. Minjingu followed with 127 respondents (32.9%), while Kakoi had the smallest representation, with 102 respondents (26.4%). The gender distribution was slightly skewed towards males, who comprised 56.0% of the sample. All demographic information of respondents is summarized and presented in Table 4.1.

Table 4.1: Socio-economic Characteristics of Respondents

Characteristic	Category	Frequency	Percentage
Name of the study village	Vilima Vitatu	157	40.7
	Minjingu	127	32.9
	Kakoi	102	26.4
Sex of Respondents	Male	216	56.0
	Female	170	44.0
Age of Respondents (years)	Below 18	5	1.3
	18-25	39	10.1
	26-35	134	34.7
	36-45	97	25.1
	46-60	82	21.2
	Above 60	29	7.5
Marital status of Respondents	Single	64	16.6
	Married	308	79.8
	Divorced	9	2.3
	Widow	5	1.3
Education level of Respondents	No formal education	39	10.1
	Primary education	252	65.3
	Secondary education	75	19.4
	Certificate /Diploma	10	2.6
	Degree graduate	10	2.6
Occupation of Respondents	Livestock keeping	93	24.1
	Farming	47	12.2
	Fishing	22	5.7
	Business	33	8.5
	Employment	30	7.8
	Mixed	161	41.7
Household Size Category	Very small size (1- 2)	65	16.8
	Small size (3 -4)	120	31.1
	Medium size (5 - 6)	104	26.9
	Large size (7 - 8)	77	19.9
	Very large size (9 - 10)	20	5.2

Source: Field data, (2024)

The demographic information provided has several important implications for the study, particularly in understanding the dynamics of household income poverty, wildlife poaching activities, and the relationship between these factors in the Burunge Wildlife Management Area (WMA). The distribution of respondents across the three villages (Vilima Vitatu, Minjingu, and Kakoi) ensures a broad perspective

on the issues studied. This is in consistent with previous studies, which have emphasized the importance of diverse sampling within rural settings to gather data that are more comprehensive and account for local variations. For example, a study by Scoones (1998) on rural livelihoods in Zimbabwe highlighted that the inclusion of multiple villages provides insights into differing proximity to the protected area, local resource use, livelihood strategies, and external pressures towards protected areas.

This study has indicated that the sample of respondents has a balanced gender representation. The balanced gender representation in this study strengthens the validity of its findings by ensuring that the perspectives of both men and women are reflected. Gender representation is crucial in studies related to livelihoods, resource use, and social dynamics, as men and women often have distinct roles, experiences, and challenges in these areas. Previous studies have similarly emphasized the importance of gender-balanced samples for comprehensive and inclusive findings. For instance, the work of Agarwal (1997) on gender and land rights highlights how different gender perspectives can reveal variations in resource access, control, and benefits. Without equal gender representation, key insights into how men and women interact with resources and economic opportunities might be overlooked.

Another study by Kabeer (1999) on social inclusion and gender dynamics in poverty studies demonstrated that gender-sensitive approaches often lead to more effective policy recommendations, as they account for the different impacts that economic or environmental interventions may have on men and women. The demographic

information in table 4.1 also showed that most respondents (59.8%) were young adults aged between 26 - 45 age groups. The predominance of respondents in this age group is significant, as these age groups typically represent individuals who are in their prime working years and are likely to be actively involved in economic activities, decision-making, and resource management. This demographic is often central to household livelihoods and plays a critical role in income generation, particularly in rural communities where economic activities such as farming and livestock keeping are common. Previous studies have consistently found that individuals in these age groups are more likely to be economically productive and engaged in community leadership. For example, a study by Ellis (2000) on rural livelihoods in Africa showed that people in their late 20s to mid-40s are the most involved in agricultural production, wage labour, and small-scale business activities.

Furthermore, findings Table 4.1 shows a high percentage (79.8%) composition of married respondents. This implies that family dynamics and responsibilities might play a significant role in decisions related to income generation activities and its relationship with wildlife poaching activities in Burunge WMA. Previous studies have highlighted the strong influence of marital status on livelihood strategies and economic decisions. For example, a study by Fisher (2004) on household decision-making in rural Tanzania found that married individuals are more likely to engage in diversified income-generating activities to meet family needs. Furthermore, the work by Nuno and St. John (2015) on local attitudes towards wildlife poaching in Tanzania's Ruaha-Rungwa ecosystem suggested that marital status influences perceptions of risk and reward associated with poaching. Married individuals,

especially those with larger families, are more likely to weigh the benefits of poaching against the potential legal risks, given the immediate need to provide for dependents.

In terms of education level of respondents, findings in Table 4.1 shows that majority of respondents (65.3%) had primary education. The low levels of formal education, with most respondents having only primary education, suggest limited access to employment opportunities beyond agriculture and unskilled labour. This could contribute to higher levels of poverty and make illegal activities like poaching more attractive or necessary for survival. This observation is in line with studies like Joppa *et al*. (2009) who identified a strong link between low educational attainment and engagement in illegal activities, including poaching. The study by Joppa *et al*. (2009) conducted in East Africa, highlighted that individuals with limited education tend to have fewer job opportunities in formal sectors, pushing them toward informal and often illegal work to meet their basic needs. Moreover, a study by Solomon *et al*. (2014) in Tanzania's Serengeti ecosystem showed that education plays a significant role in shaping attitudes towards conservation and wildlife protection. Communities with higher levels of education were more likely to understand the importance of conservation and seek alternative livelihoods, while those with low education levels were more prone to engaging in unsustainable activities like poaching.

The findings in Table 4.1 shows that large proportion (41.7%) of respondents are engaged in mixed occupations, primarily farming and livestock keeping, which suggests a reliance on subsistence activities for income. This pattern is common in

rural areas of developing countries, where individuals and households often depend on multiple sources of livelihood to meet their basic needs. Studies conducted in various regions have similarly documented the significance of mixed livelihoods in sustaining rural communities. For example, Ellis (2000) noted that mixed farming and livestock keeping are often adopted as risk management strategies in rural communities. Ellis (2000) emphasized that this livelihood strategy is prevalent in sub-Saharan Africa, where agriculture remains rain-fed and unpredictable, and households turn to livestock keeping as a complementary income source.

Similarly, a study by Barrett *et al*. (2001) found that in rural areas of East Africa, including Tanzania, mixed farming and livestock keeping are integral to household survival strategies. In addition, Kristjanson *et al*. (2010) noted that in rural Kenya and Tanzania, households that engaged in both farming and livestock keeping were better able to withstand economic shocks, such as fluctuating crop yields or changes in market prices. The combination of crop production for food and livestock rearing for income allowed households to remain food secure, even in challenging conditions.

Furthermore, the findings in table 4.1 shows that, in terms of household size, the majority of households fall into the small size category (3-4 members), representing 31.1% of respondents. this is followed by medium size households (5-6 members), which make up 26.9%, and very small size households (1-2 members), accounting for 16.8%. the presence of large size households (7-8 members) is significant as well, constituting 19.9%, while very large size households (9-10 members) are the least

common, at just 5.2%. This breakdown suggests that the family unit in the study area tends to be relatively small to medium-sized, with a notable portion of the population living in households of 3 to 6 members.

Contrary to this study, previous studies such as Ellis (2000), documented that rural households often consist of many individuals, as there is a preference for living in extended family structures. This trend is particularly prevalent in many rural areas where cultural norms emphasize family unity and support. This variation in household size between the present study and previous studies such as Ellis (2000) could be attributed to socio-economic differences whereby the present study area may differ socio-economically from regions studied by Ellis (2000). Other plausible cause of the variation might be due to changes in cultural practices. Over time, cultural shifts and modernization may lead to a reduction in the preference for extended family living arrangements. This is especially true in more developing regions where societal norms are evolving.

4.3. Level of Household Income Poverty among Residents Surrounding Burunge WMA

This section presents the findings on the level of household income poverty among residents surrounding Burunge (WMA). The analysis focuses on the various sources of household income, including livestock keeping, farming activities, fishing, business ventures, employment, and other income-generating activities. Additionally, the section examines the total monthly household income derived from these sources, providing insights into the economic conditions of residents in this area.

4.3.1 Sources of Household Income

The sources of household income among residents surrounding Burunge (WMA) were distributed across various activities, including livestock keeping, farming, business, fishing, and employment as presented in Figure 4.1.

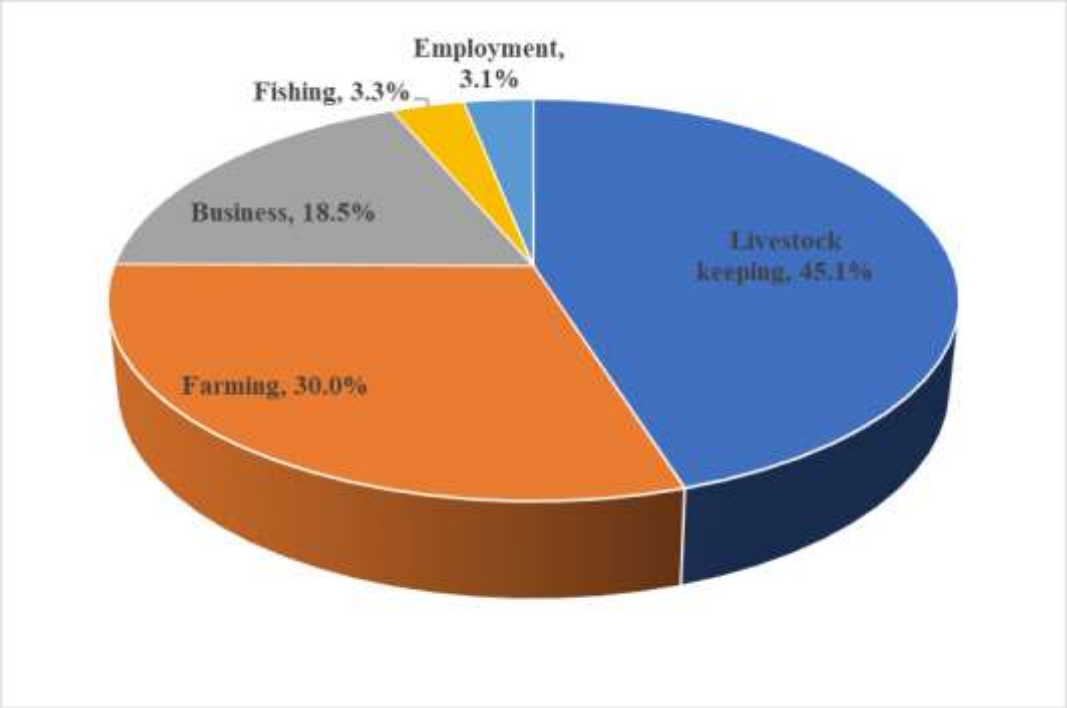

Figure 4.1: Distribution of sources of Household Income among residents surrounding Burunge WMA

Source: Field data, (2024)

Livestock keeping, particularly cattle, goats, sheep and poultry, is the predominant source of income in the study area as reported by 45.1% of respondents. This significant percentage suggests that livestock plays a central role in the economic and social fabric of the community. Livestock keeping likely offers a reliable means of subsistence and income, providing food, transportation, and goods that can be sold or

traded. The livestock are kept in traditional means typically characterized by small-scale, subsistence-oriented farming practices. The methods used in traditional livestock keeping are usually extensive, with animals being grazed on communal lands or open pastures. This form of livestock management often involves minimal input in terms of veterinary care, supplementary feeding, or modern technology.

This finding aligns with previous research that underscores the importance of livestock to rural economies and subsistence in various contexts. According to Thornton (2010), livestock contributes to both household income and food security by providing dairy, meat, manure for farming, and draft power. Similarly, a study conducted in Tanzania by Kaitibie *et al*. (2008) revealed that livestock not only enhances household food security but also provides an economic buffer in times of need. In addition, the study by McPeak & Little (2005) noted that livestock provides social capital in traditional ceremonies, as cattle, goats, and sheep are frequently used as dowries or exchanged in marriage and other significant life events. Comparing the findings of this study with these previous studies shows a consistent pattern: livestock plays a fundamental role in economic stability, social cohesion, and resilience within rural communities. The reliance on livestock remains strong in areas with limited access to more formal income-generating opportunities, further cementing its role as a backbone of rural livelihoods.

Farming encompasses both subsistence and cash crops, playing a crucial role in food security and income generation, was reported by about one third (30%) of respondents. Primarily relying on rain-fed farming, farmers mostly cultivate maize

and beans for subsistence, while rice, sesame, and cotton are grown as cash crops. This indicates that subsistence farming is a vital activity for a substantial portion of the population. The prominence of farming as a livelihood suggests that many households engage in it either as their primary activity or in combination with other sources of income, particularly livestock keeping. The significance of farming in providing both subsistence and cash crops is well-documented in various studies. This aligns with findings from studies such as those by Pretty *et al*. (2014) who discussed how sustainable intensification in agricultural systems can enhance food security and economic resilience among farming communities. Their research emphasizes the dual role of crops, where subsistence farming ensures food security for households while cash crops serve as vital sources of income.

Business activities account for 18.5% of household incomes, reflecting a notable level of entrepreneurial activity within the community. The presence of business as a significant income source indicates that there are opportunities for trade, retail, or services that cater to the needs of the local population. This sector's role in the local economy also point to the development of markets and the circulation of goods and services within the region. Fishing contributes to 3.3% of household incomes, indicating that it is a less common livelihood activity. The lower percentage is due to limited access to water bodies or the availability of other more dominant income-generating activities, such as livestock keeping and farming. However, for those engaged in fishing, it likely provides a crucial supplemental income, particularly in areas close to lakes or rivers.

Formal employment accounts for 3.1% of household incomes, suggesting that formal job opportunities are relatively scarce in the area. This could include jobs within the WMA, nearby towns, or in public services. The low percentage may reflect a local economy that is more dependent on traditional livelihoods than on wage employment, possibly due to limited industrial or commercial development in the region. The findings of this study are essentially in line with previous research conducted by Homewood, Trench, and Brockington (2012), which highlighted the significance of pastoralism and farming as key livelihood strategies for communities living near protected areas in East Africa. Similarly, Nelson and Agrawal (2008) emphasized the role of community-based natural resource management in shaping local economies, where activities such as livestock keeping and small-scale farming remain dominant. Additionally, consistent with the findings in this study, Kideghesho (2008) found the co-existence between traditional societies and wildlife in the Serengeti region, noting that livestock rearing and farming are critical sources of household income.

4.3.2. Household Monthly Income

The household monthly incomes among residents surrounding Burunge WMA showed that households earn an average of TZS 593,847 per month from livestock keeping, farming activities, business, employment and other sources. Specifically, households earn an average of TZS 354,339 from livestock keeping, TZS 310,652 from farming activities, TZS 310,772 from business, TZS 356,410 from employment, and TZS 152,272 from other sources as presented on Table 4.2.

Table 4.2: Household Monthly Incomes (TZS) Among Residents Surrounding Burunge WMA

Type of household income sources	n	Minimum	Maximum	Average
Total household monthly income	386	50,000	5,600,000	593,847
The household monthly income derived from employment	39	50,000	600,000	356,410
The household monthly income derived from livestock keeping	227	30,000	3,000,000	354,339
The household monthly income derived from business	123	30,000	2,000,000	310,772
The household monthly income derived from farming activities	299	40,000	3,000,000	310,652
The household monthly income from other sources	22	50,000	300,000	152,272

Source: Field data, (2024)

Further statistical analysis using the Chi-Square test demonstrated a strong relationship between household monthly income and respondents' occupations (χ^2 = 90.549, df = 20, $p<0.05$) (Appendix 5). This suggests that the type of occupation significantly influences the income levels of households. For example, those involved in formal employment, livestock keeping or business, tend to have higher monthly incomes compared to those solely dependent on farming or other informal sources. The statistically significant result confirms that differences in occupation play a critical role in shaping the economic well-being of households in the area, with some occupations (such as formal employment and livestock keeping) providing more stable and higher income levels than others. This finding highlights the importance of promoting diverse and sustainable livelihood options to improve household income and reduce dependence on vulnerable income sources such as subsistence farming.

The findings of this study are in line with Ellis (2000), who noted that livestock serves as a crucial economic asset and safety net in rural communities living around protected areas, providing not only income but also a form of savings and a measure of wealth. Additionally, Haggblade *et al*. (2007) emphasize the importance of diverse income sources, including both agricultural and non-agricultural activities, for rural households' economic stability, which is consistent with the varied income streams reported in this study.

4.3.3 Household Expenditures

The findings reveal that household expenditures among residents surrounding Burunge WMA vary significantly across different expenditure categories. On average, households spend TZS 105,051 per month on food, which is the largest expenditure category. Clothing expenses average TZS 64,283 per month, while spending on shelter averages TZS 39,850 per month (Table 4.3).

Table 4.3: Household Monthly Expenditures (TZS)

Household expenditure categories (TZS)	Minimum	Maximum	Average
Expenditure for food	20,000	500,000	105,051
Expenditure for clothes	10,000	250,000	64,283
Expenditure for shelter	20,000	80,000	39,850

Source: Field data, (2024)

These expenditure patterns indicate that food represents the most significant financial commitment for households, reflecting its essential role in meeting basic needs. Clothing and shelter, though important, represent a smaller portion of household budgets. These spending habits can provide insights into the economic pressures

faced by residents and their potential impact on engagement in activities such as wildlife poaching, as financial constraints may drive households to prioritize immediate needs over conservation efforts.

Further statistical analysis using the Chi-Square test demonstrated a strong relationship between respondents' occupations and household monthly expenditure for food ($\chi^2 = 283.963$, df = 85, $p<0.05$), household monthly expenditure for clothes ($\chi^2 = 178.687$, df = 60, $p<0.05$), and household monthly expenditure for shelter ($\chi^2 = 80.783$, df =20, $p<0.05$) (Appendix 6). This result shows a strong association between respondents' occupations and their monthly spending on food, clothes and shelter. For instance, Individuals engaged in higher-income occupations, such as formal employment, tend to allocate more funds to essential categories like food, as they have greater disposable income. Conversely, individuals in lower-income occupations, such as subsistence farming or casual labor, often face tighter financial constraints.

The expenditure patterns indicating food as the most significant financial commitment for households align with findings from several previous studies. For example, in a study conducted by Organization (FAO, 2017) showed that for low-income households in Sub-Saharan Africa, food expenditure often dominates the household budget, leaving limited capacity for discretionary spending. Moreover, Jambiya *et al. (*2007) examined the economic drivers of wildlife poaching in Tanzania, concluding that poverty and food insecurity play crucial roles in pushing households toward unsustainable activities like poaching.

4.3.4. Household Income Poverty

In this study, individual income poverty levels collected from the head of household are used to represent household income poverty levels. This is justified by the fact that, in most households, the head of household typically serves as the primary provider, responsible for supporting the financial needs of the entire family. As such, their income largely determines the household's ability to meet essential needs, including food, healthcare, and education. Since other household members, such as children or non-working adults, rely on the head of household for their economic wellbeing, the poverty status of the household is directly tied to the income level of the head of household.

Additionally, the head of household's income provides a practical and efficient measure for assessing household income poverty levels. Collecting income data from every member of the household was challenging and time-consuming, especially in rural areas with informal income sources. By focusing on the head of household, data collection was more manageable while still offering a meaningful representation of the household's overall economic condition. Therefore, using the head of household's income as a proxy for household income poverty levels is a reasonable and justified approach in this study.

Therefore, this study reveals that 18.9% of households surrounding Burunge WMA are living in extreme poverty, 14.2% are in moderate poverty, and 21.8% are vulnerable to poverty. In contrast, 45.1% of households are categorized as non-poor (Table 4.4).

Table 4.4: Household Income Poverty Levels

Household monthly income thresholds		Poverty levels	n	%
USD	TZS			
Below 57	Below 153,900	Extreme Poverty	73	18.9
57 - 96	153,900 - 259,200	Moderate Poverty	55	14.2
96.1 - 165	259,201 - 445,500	Vulnerable to Poverty	84	21.8
Above 165	Above TZS 445,500	Non-Poor	174	45.1

Source: Field data, (2024)

The findings reveal a notable distribution of poverty levels among households surrounding Burunge Wildlife Management Area (WMA). Specifically, 18.9% of households are living in extreme poverty, indicating that nearly one-fifth of the population struggles with severe deprivation, likely lacking basic necessities such as food, shelter, and healthcare. Additionally, 14.2% of households are classified as living in moderate poverty, suggesting they face significant financial challenges but are not as severely deprived as those in extreme poverty. Moreover, 21.8% of households are identified as vulnerable to poverty, implying that while these households are not currently classified as poor, they are at high risk of falling into poverty due to economic shocks or adverse conditions.

On the other hand, 45.1% of households are categorized as non-poor, meaning they have sufficient resources to meet their basic needs and are relatively more stable financially compared to the other groups. However, the fact that over half of the households are either in poverty or vulnerable to it highlights the economic struggles of the community, underscoring the need for targeted interventions to reduce poverty and improve livelihoods in the area. Further statistical analysis using the Chi-Square test confirmed a strong relationship between household income poverty levels and

the respondents' occupations (χ^2 = 103.276, df = 15, $p<0.05$) (Appendix 7). This significant result suggests that the type of occupation held by household members is a critical factor influencing household income poverty levels. For instance, households involved in lower-income activities such as informal labour (TZS 152,272) or subsistence farming (TZS 310,652) are more likely to experience extreme or moderate poverty, while those engaged in higher-income occupations such as formal employment (TZS 356,410) or livestock keeping (TZS 354,339) are more likely to be categorized as non-poor.

The analysis highlights the occupational disparities that contribute to varying income poverty levels, underlining the need for targeted interventions to improve income-generating opportunities for those in low-paying or unstable occupations. These findings emphasize the critical need for integrated poverty alleviation and sustainable development strategies in the Burunge WMA area to create resilient, economically empowered communities while promoting wildlife conservation efforts. The findings of this study are in agreement with the study by Mojo *et al.* (2020), which found significant poverty levels among households adjacent to protected areas, with 59% living below the USD 1.90 per day poverty line and 76% below the USD 3.10 per day poverty line. This study also aligns with the research by Keane *et al*. (2020), which reported a high proportion of households in Tanzanian WMA villages classified as Poor or Very Poor. The similarity in poverty levels highlights the economic challenges faced by communities surrounding wildlife management areas.

In addition, the findings of study are in agreement with the study by Gollin (2014), who found that rural areas in sub-Saharan Africa frequently experience high poverty

rates due to limited economic opportunities and inadequate infrastructure. Similarly, Dercon and Shapiro (2007) observed that rural households in Africa are often vulnerable to economic shocks. Sahn and Stifel (2003) further support this finding by highlighting the persistent and multidimensional nature of rural poverty in Africa, reflecting the high levels of extreme and moderate poverty reported in this study. Additionally, the work of Fafchamps and Shilpi (2008) reinforces the importance of income diversification in reducing rural poverty.

4.4. Trend, Engagement and Reasons for Wildlife Poaching Activities in Burunge WWMA

This section presents the findings regarding the trend of poaching incidences in Burunge WMA from 2019 – 2023, engagement in poaching activities and reasons for poaching activities in Burunge WMA.

4.4.1. Trend of poaching incidences in Burunge WMA from 2019 – 2023

The analysis of secondary data showed that there was a general decrease in the number of poaching incidences from 25 cases in 2019 to 18 cases in 2023 (Table 4.5).

Table 4.5: Trend of poaching incidences in Burunge WMA from 2019 – 2023

Year	Types of poached animals	Poaching incidences	% change
2019	Elephants, antelopes, zebra, wildebeest, giraffe, warthogs	25	-
2020	Elephants, antelopes, zebra, wildebeest, giraffe	23	8.7
2021	Elephants, antelopes, zebra, wildebeest, giraffe	22	4.5
2022	Zebras, giraffes, gazelles, birds, wildebeests, lions	19	15.8
2023	Giraffes, zebras, gazelles, antelopes, and various species of birds	18	5.6

Source: Burunge WMA, 2024

The results in Table 4.5 indicate an overall decline of 28% of poaching incidents, decreasing from 25 cases in 2019 to 18 cases in 2023, over the five-year period. The percentage changes indicate a fluctuating but consistent downward trend: an 8.7% decrease from 2019 to 2020, a smaller 4.5% decline in 2021, a more significant reduction of 15.8% in 2022, and a 5.6% decrease in 2023. This trend suggests ongoing efforts to address poaching, although persistent challenges remain.

The types of poached animals also shifted slightly over the years. Elephants, antelopes, zebras, wildebeests, and giraffes are the commonly targeted in the early years. By 2022 and 2023, the list included gazelles, birds, and lions, indicating a diversification of species targeted by poachers. The focus on high-value species like elephants in earlier years points to the commercial nature of poaching, whereas the inclusion of smaller species in later years could suggest changing dynamics in poaching practices or the depletion of larger wildlife populations. The key informants noted that poaching incidents in Burunge WMA showed a declining trend from 2019 to 2023. During the interview, one key informant emphasized:

> *Before the initiation of collaborative anti-poaching efforts in 2017, we used to find about 3–7 trapped animals daily. Since then, poaching cases have significantly decreased in the WMA. It is evident that collaborative anti-poaching efforts have been fruitful in curbing illegal hunting activities* (Burunge WMA leader, 5th June, 2024).

The reduction in poaching incidences in the Burunge Wildlife Management Area (WMA) was attributed to collaborative anti-poaching efforts initiated by local authorities and supported by key stakeholders. Since 2017, NGOs including PAMS Foundation has actively contributed to elephant protection, while Chemchem Association and Tanzania Wildlife Authority (TAWA) joined these efforts in 2019 to combat poaching more broadly. Initially, Babati District Council (DC) and WMA managed anti-poaching activities independently but faced challenges in curbing the practice effectively. Recognizing the need for additional support, they developed proposals seeking assistance, resulting in partnerships with PAMS Foundation and Chemchem Association.

These collaborations introduced robust measures, including joint patrols conducted by NGOs, TAWA Northern Zone, Babati DC, WMA, and local communities. Educational campaigns further increased awareness, and a reward system offering TZS 1 million incentive for informers who successfully report poachers. This incentive created widespread fear among potential offenders, as community members eagerly competed for the reward. This comprehensive approach significantly reduced poaching incidences in the study area.

4.4.2 Engagement in Poaching Activities in Burunge WMA

The findings in this study indicates that awareness of poaching activities among residents surrounding Burunge WMA is divided into 42.5% of respondents being aware of poaching activities in the area, while 57.5% are not aware (Figure 4.2).

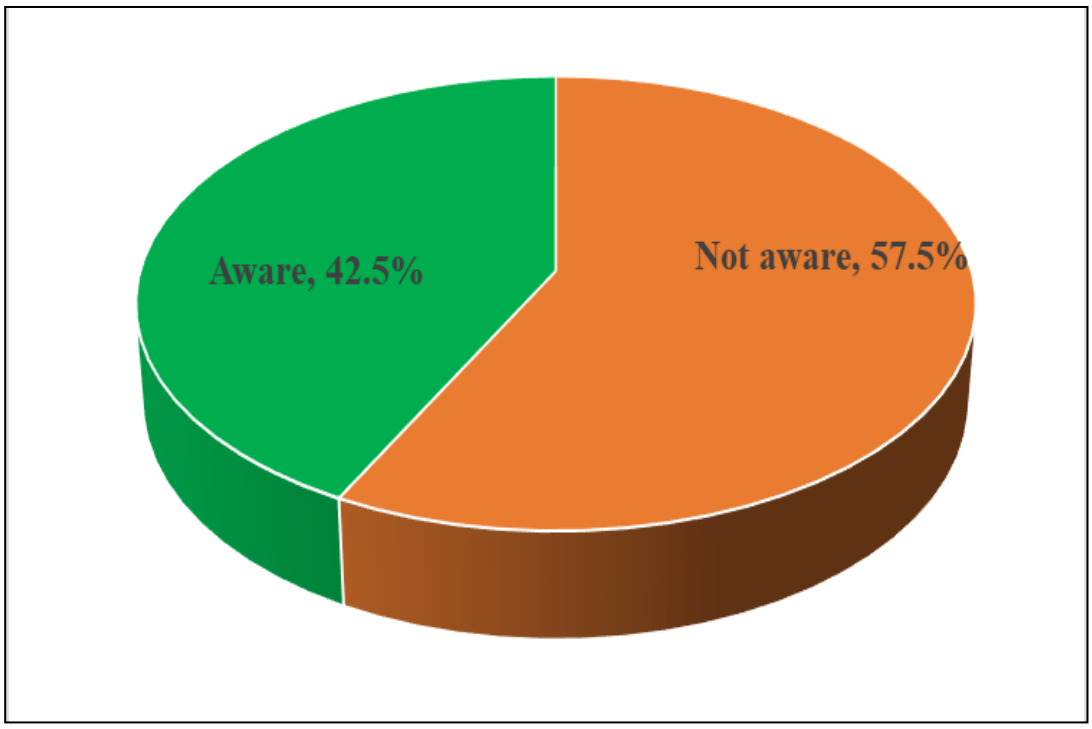

Figure 4.2: Awareness of Poaching among Residents Surrounding Burunge WMA

Source: Field data, (2024)

The findings of this study reveal a notable disparity in awareness of occurrence of poaching activities among residents surrounding the Burunge Wildlife Management Area (WMA). Specifically, 42.5% of respondents indicated they were aware of poaching activities in the area, while a larger portion, 57.5%, reported being unaware. This significant gap in awareness suggests that attitudes and behaviours toward poaching can differ greatly within the community. This considerable

knowledge gap concerning poaching issues indicates that attitudes and behaviours towards poaching can differ significantly within the community. Consequently, this disparity in awareness could hinder efforts to combat poaching activities, as individuals who are unaware of poaching activities may not fully understand the consequences of such activities for their environment and community.

The findings from key informants indicate that local communities understand poaching mainly through illegal hunting for commercial purposes and subsistence poaching. Illegal hunting for commercial purposes involves targeting wildlife for profit, focusing on species with high-value attributes such as meat, tusks, or hides. Some informants also noted that such activities might involve collaboration with certain community members, adding a layer of complexity to enforcement efforts. On the other hand, subsistence poaching, is viewed as small-scale hunting motivated by the need to meet immediate household needs or cope with economic pressures.

However, there is a misalignment between the community's understanding of poaching and legal definitions. Practices such as collection of herbs/local medicines, trapping or collecting eggs and ornaments which are considered traditional or cultural activities, are not always recognized as poaching activities by local community. This divergence is influenced by a historical context in which such activities were essential for subsistence or linked to cultural traditions. Additionally, economic hardships blur the lines of legality, as some individuals view poaching as an unavoidable response to their circumstances. This observation is supported by one of the key informants who emphasized:

> *Many community members do not view practices like collection of traditional medicines, trapping small animals or collecting eggs as poaching. They see these actions as traditional activities or necessary survival strategies, rather than illegal acts. This misunderstanding reflects the disconnect between legal definitions and local perceptions, highlighting the need for more education on wildlife conservation* (WMA Leader, 5th June, 2024).

The quotation highlights a misalignment between legal definitions of poaching and local community perceptions, which can hinder conservation efforts. Activities such as collection of herbs, trapping or collecting eggs are often seen as traditional or subsistence practices rather than poaching, reflecting a lack of awareness about their ecological impact and legal implications. The same observation was supported by another key informant who stated:

> *We used to access various resources from this WMA for traditional and cultural purposes. It was part of our way of life, and we did not see it as illegal or harmful. Now, with the new regulations in place, these activities are considered poaching, which creates confusion and resistance among us* (Former poacher from Vilima Vitatu village, 12th June, 2024).

This quotation implies that residents may not fully understand the modern laws and regulations surrounding wildlife conservation. What the local communities previously viewed as acceptable traditional or cultural practices, such as accessing resources from the WMA for traditional purposes, are now classified as illegal activities under conservation laws and regulations. Another key informant added the following:

> *These practices of using wildlife resources from the WMA for traditional and cultural purposes are deeply tied in our*

> *communities, particularly among the pastoralists. For us, it's not merely about survival; it's about preserving our way of life and maintaining our connection to the land. We have been practicing this for generations* (Village leader, 8th June, 2024).

This implies that traditional and cultural practices involving the collection of wildlife resources are integral to the identity and survival of the communities, particularly among pastoralists. These practices are not simply about meeting immediate needs but are tied to their cultural heritage, spiritual beliefs, and a deep-rooted connection to the land. This highlights the challenge in reconciling conservation efforts with the rights and traditions of local communities, especially when they see these activities as a legitimate part of their cultural heritage. Consequently, it underscores the need for inclusive conservation approaches that respect local traditions while still aiming to protect wildlife resources.

The findings of this study align with earlier research by Bitanyi *et al*. (2012), which highlighted that cultural factors significantly influence poaching practices in Tanzanian communities, where bushmeat hunting is often regarded as a traditional activity handed down through generations. Such practices are commonly linked to rituals, medicinal uses, or communal ceremonies. Similarly, Lindsey *et al*. (2013) explored the cultural demand for wildlife products across African societies, emphasizing their use in traditional healing and as symbols of social status, which sustains the demand for illegal hunting activities. Further, the finding in this study reflects a broader trend observed in previous studies such as Knapp (2012) who discusses the socio-economic factors that drive poaching in the Serengeti, suggesting that poverty and lack of alternative livelihoods significantly impact awareness and

engagement in poaching activities. While the study in Burunge WMA reflects a concerning gap in awareness of poaching activities, it aligns with and expands upon the findings of previous studies that underscore the importance of socio-economic contexts, community awareness and engagement in understanding and addressing poaching activities.

Further analysis on the frequency of engagement in poaching activities within Burunge Wildlife Management Area (WMA) indicates that the majority (94.5%) of individuals among those who were aware of poaching activities admitted to have participated in such activities at least a few times annually (Figure 4.3). A smaller portion, 4.1%, engages in poaching several times a month, while only 1.4% reported poaching at least once a month.

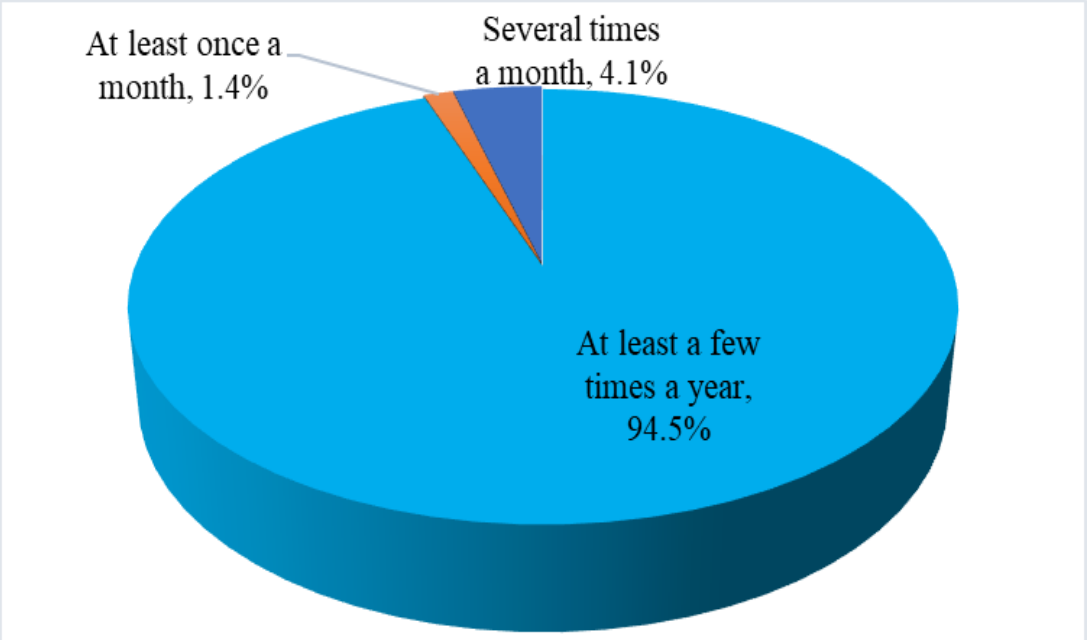

Figure 4.3: Frequency of Engagement in Poaching Activities in Burunge WMA

Source: Field data, (2024)

This finding suggests that the presence of individuals engaging in poaching multiple times a month is a significant threat to wildlife, emphasizing the need for targeted interventions to curb such behaviours, particularly among the smaller group of frequent offenders. The Chi-square test revealed a significant association between the frequency of poaching activities and household income poverty levels ($\chi^2 = 67.681$, $df = 6$, $p < 0.05$) (Appendix 8). This suggests that individuals living in extreme poverty are more likely to engage in poaching activities, possibly as a coping mechanism to meet immediate economic needs.

These results are consistent with the study by Wilfred and Maccoll (2011), who found that as income from crops such as tobacco, groundnuts, and maize increased, the frequency of wildlife poaching decreased. Similarly, livestock, particularly cattle and goats, significantly influenced poaching frequency, with increased income from these livestock leading to a reduction in poaching. Additionally, villages with higher mean values of productive assets had significantly lower poaching rates, while an increase in manpower corresponded with a decrease in poaching.

4.4.3. Reasons for Wildlife Poaching Activities

It was found that the major reasons for poaching activities in Burunge WMA are the poaching of bush meat for commercial purposes and subsistence. Additionally, poaching for traditional medicine, ornaments, and other wildlife products were less prevalent but still contributed to the overall poaching activities as shown in Figure 4.4.

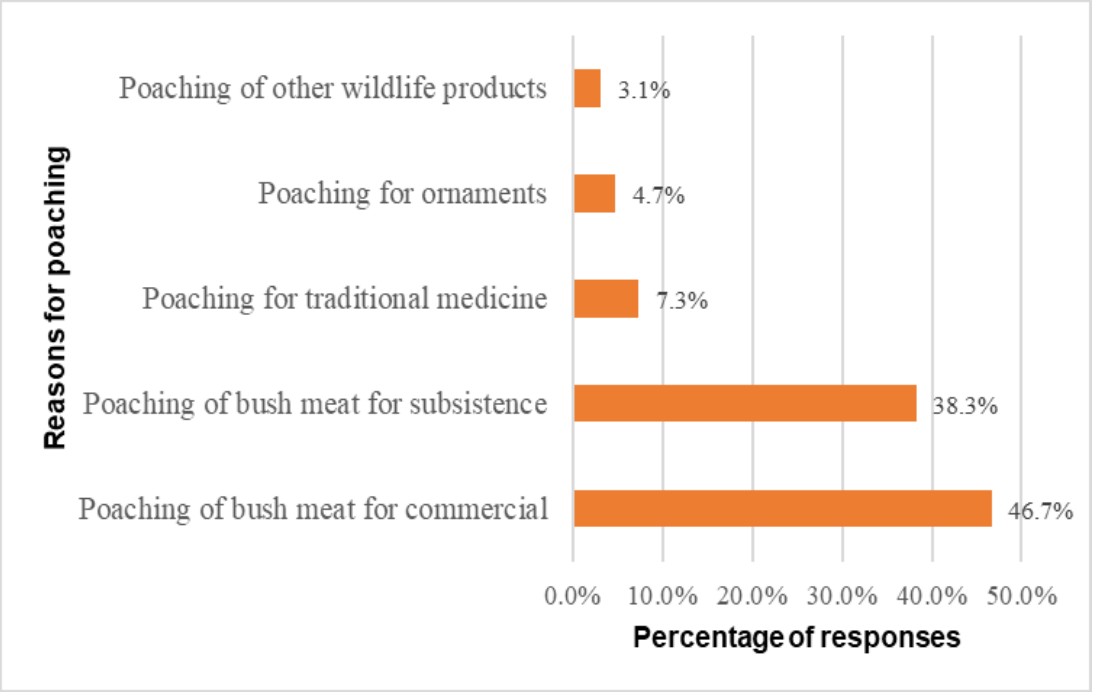

Figure 4.4: Reasons for Poaching Activities in Burunge WMA

Source: Field data (2024)

The findings indicate that the main reason for poaching is bush meat for commercial purposes (46.7%), suggesting that a significant portion of poachers is motivated by the economic benefits derived from selling bush meat. This highlights the role of financial incentives in driving poaching activities, as individuals may rely on the illegal wildlife trade to supplement their income. Furthermore, poaching bush meat for subsistence (38.3%) is also a major factor, with more than one-third of the individuals involved in poaching relying on wildlife as a food source. This indicates that poverty and food insecurity contribute significantly to poaching activities. Other reasons for poaching include traditional medicine (7.3%), ornaments (4.7%), and other wildlife products (3.1%). These fewer common motivations reflect cultural practices and the use of wildlife in traditional purposes play roles in poaching activities.

The former and retired experience poachers elaborated that that their involvement in poaching is driven by the promise of quick financial returns, which made it an attractive source of income. During the interview, one of the key informants stressed as follows:

> *We used to engage in poaching because it provided quick money. We had reliable market connections, and since we had no formal education, and had no alternative source of income. We also inherited hunting weapons from our parents for poaching, so it was the only economic activity we knew (Former poacher from Vilima Vitatu village, 12th June, 2024).*

The quotation suggests that economic hardship, lack of education, and limited livelihood options drive individuals to engage in poaching as a primary source of income. It highlights how quick monetary gains and established market connections incentivize illegal hunting activities. Moreover, the generational inheritance of hunting weapons and skills reflects a deeply ingrained cultural practice, indicating that poaching is not merely an economic activity but also a way of life for some communities. This implies that without addressing these root causes; economic dependence, market demand, and cultural practices efforts to curb poaching may face resistance. It also underscores the importance of community-centered interventions, such as providing alternative livelihoods, education, and awareness campaigns, to break the cycle of reliance on illegal wildlife exploitation.

The statistical analysis using Chi-square test reveals a significant association between household income poverty levels and various reasons for poaching. Specifically, Chi-square test indicated that poaching of bush meat for commercial

purposes was significantly associated with household income poverty levels (χ^2 = 7.582, df = 3, $p < 0.05$) (Appendix 9). The finding implies that poverty plays a significant role in driving individuals to poach bush meat for income, likely because of economic necessity. Similarly, Chi-square test showed that poaching of bush meat for subsistence was statistically associated with household income poverty levels (χ^2 = 13.881, df = 3, $p < 0.05$) (Appendix 9). This suggests that households experiencing poverty are more likely to engage in poaching for subsistence needs, likely because they rely on bush meat as a critical source of food when other resources are limited.

Further, Chi-square test indicated that poaching for traditional medicine also had a significant association with household income poverty levels ($\chi^2 = 11.016$, df = 3, $p < 0.05$) (Appendix 9). This could indicate that poorer households might resort to using wildlife products for traditional medicine, either due to cultural practices or limited access to formal healthcare services, which drives poaching of certain species for medicinal purposes. Furthermore, Chi-square test established that that poaching for ornaments is another activity significantly linked to household income poverty levels (χ^2 = 23.654, df = 3, $p < 0.05$) (Appendix 9). This result suggests a strong relationship, implying that individuals from lower-income households are more likely driven to poach wildlife for ornamental purposes, possibly as a means of generating income by selling these items in local or black markets.

The findings of this study align with the observations made by Davies and Brown (2007) and Ripple *et al*. (2016), who noted that poaching for bushmeat is a prevalent issue across Africa. The study's data showing that 46.7% of poaching activities are

driven by commercial purposes and 38.3% by subsistence is consistent with the literature on the high demand for bushmeat due to its affordability and availability (Ndibalema & Songorwa, 2007; Ordaz-Németh *et al*., 2017). The study also supports the findings of Agrawal and Redford (2006) and Brockington and Wilkie (2015), who highlight that poor agricultural productivity and limited livelihood alternatives drive subsistence poaching. The relatively low prevalence of poaching for traditional medicine, ornaments, and other wildlife products indicates that while these activities exist, they are not as predominant as bushmeat poaching, a pattern also observed by Coad (2007) and Harrison *et al*. (2015).

4.5. Relationship between Household Income Poverty and Poaching Activities in Burunge WMA

It was found that 25.2% of respondents were of the view that inadequate education and skills due to poverty significantly influence poaching activities. Additionally, 21.0% were of the opinion that the lack of alternative livelihoods drives people to poach, while 20.6% mentioned economic desperation as one of major influence for poaching. Debt and financial pressure were reported by 16.9% of respondents as contributing to poaching. Furthermore, 6.5% attributed poaching to dependence on natural resources and limited access to markets of their products. Social norms were noted by 3.3% of respondents as influencing factors towards poaching activities (Table 4.6).

Table 4.6: Drivers of Household Income Poverty in Poaching Activities in Burunge WMA

Drivers to poaching activities	Frequency	Percentage
Inadequate education and skills	244	25.2
Lack of alternative livelihoods	203	21.0
Economic desperation	199	20.6
Debt and financial pressure	163	16.9
Dependence on natural resources	63	6.5
Limited access to markets	63	6.5
Social norms	32	3.3

Source: Field data, (2024)

The respondents added that poverty often results in limited access to education and skill development. When individuals in impoverished communities lack education and training, their opportunities for legal employment are restricted. Without the necessary skills to pursue alternative, legitimate means of earning a livelihood, these individuals may turn to poaching as an accessible means of income. The lack of education not only limits their career prospects but also reduces their awareness of conservation issues and legal ramifications, making poaching a more attractive option due to its immediate financial benefits.

A direct consequence of poverty is the scarcity of alternative livelihood opportunities. When communities face economic hardships and do not have access to diverse income sources, they may resort to poaching to meet their basic needs. This is especially true in areas where poaching provides a more immediate or substantial financial return compared to other available legal activities. The absence of alternative income-generating activities reinforces the dependency on poaching, making it a prevalent choice among those struggling with poverty.

Economic desperation drives individuals to engage in activities that might otherwise be avoided. When families face severe financial strain, the urgency to secure immediate income can lead to decisions that prioritize short-term survival over long-term consequences. In such desperate situations, poaching becomes a viable option for generating income quickly, despite the associated risks and legal consequences. This desperation underscores how extreme financial pressure can override moral or legal considerations, pushing individuals toward illegal activities like poaching.

Debt and financial pressures are significant contributors to poaching activities. Individuals and families burdened with debt or financial obligations may turn to poaching as a means of repayment or to alleviate their financial stress. The need to meet debt repayments or manage financial pressures can drive people to engage in illegal activities, including poaching, which provides a potentially lucrative, though illegal, means of addressing financial issues.

Communities that rely heavily on natural resources for their livelihoods may be more inclined to poach due to a lack of alternative resources. In areas where natural resources are central to daily life and economic activities, the depletion or restriction of these resources can lead to increased poaching as individuals seek to fulfil their needs. When natural resources are seen as a primary or only source of income, any perceived or actual threats to these resources can prompt communities to engage in poaching to maintain their livelihoods. Limited access to markets can exacerbate poaching activities. When communities cannot sell their products or access markets where they could earn a fair income legally, they may turn to poaching as an

alternative means to sell wildlife or wildlife products. This lack of market access not only limits economic opportunities but also makes illegal markets for wildlife more attractive as a source of income.

Social norms and cultural acceptance of poaching can also play a role, though to a lesser extent. In some communities, such as indigenous population such as Hadzabe and Barbaig poaching might be normalized or culturally ingrained, making it a more acceptable or even expected activity. Such social norms can perpetuate poaching despite other economic factors, as engaging in poaching becomes part of the community's practices or traditions. The key informants added that the drivers of poaching activities include poverty, lack of alternative income sources, and the destruction of crops and livestock by wild animals. One of the key informants insisted that:

> *Sometimes, local communities harvest wildlife resources as a means of compensating for the damage caused by wild animals. We engage in farming, but wildlife often destroys our crops, leaving us without necessities such as food and money for medical expenses. Additionally, dangerous animals like lions, leopards, and hyenas sometimes invade our homes and kill our livestock. These occurrences exacerbate our poverty, as we depend on agriculture and livestock for income. As a result, poaching wild animals becomes the only immediate solution for survival* (Village leader, 8th June, 2024).

The quotation has the implication that poaching is not merely a criminal activity, but a coping mechanism driven by socio-economic challenges. The communities are involved in poaching due to extreme poverty, lack of alternative livelihoods, and the destruction of their agricultural and livestock-based assets by wild animals. This

suggests that addressing poaching effectively requires tackling the root causes, such as poverty, lack of education, and limited access to sustainable economic alternatives. Furthermore, it highlights the need for comprehensive approaches that include improving local livelihoods, providing alternative income sources, and enhancing community engagement in conservation efforts to reduce reliance on poaching.

Notably, statistical analysis using the Chi-Square test showed a strong association between engagement in poaching and household income poverty levels ($\chi^2 = 33.452$, $df = 3$, $p<0.05$) (Appendix 10). This significant relationship highlights that income poverty is a major factor influencing poaching behaviour in the area. Households experiencing extreme or moderate poverty are more likely to resort to poaching as a means of survival. Economic desperation, lack of alternative livelihoods, and dependence on natural resources drive individuals to exploit wildlife for subsistence or commercial purposes. These households, often lacking adequate income to meet their basic needs, view poaching as an immediate solution to their financial struggles, especially in regions with limited job opportunities and poor market access.

Furthermore, the high correlation between poverty and poaching suggests that alleviating household poverty could significantly reduce poaching activities. This would require creating sustainable alternative livelihoods, improving education, and ensuring that vulnerable households have access to financial resources. By addressing the root causes of economic hardship, the pressure on wildlife can be reduced, leading to better conservation outcomes while improving the overall well-

being of the community. The data underscores the critical need for poverty reduction strategies as part of a comprehensive approach to combating poaching in Burunge WMA.

The findings of this study, which reveal that inadequate education and skills due to poverty, lack of alternative livelihoods, economic desperation, and debt significantly influence poaching activities, align with previous research. Mackenzie *et al*. (2011) and Twinamatsiko *et al*. (2014) both highlight that poverty drives individuals to engage in illegal wildlife hunting to meet basic needs. Specifically, Twinamatsiko *et al*. (2014) found that those arrested for unauthorized activities in Bwindi National Park were significantly poorer and lived closer to the park, emphasizing the link between proximity to protected areas and poverty. Harrison *et al*. (2015) further supports this, noting that poverty alleviation is crucial for reducing illegal wildlife hunting. The ICCF (2014) and the U.K. Government (2013) also acknowledge extreme poverty as a primary driver of illegal wildlife hunting, reinforcing the argument that economic hardship leads to increased poaching. These findings underscore the need for comprehensive approaches to addressing the socio-economic drivers of poaching and mitigating its broad-ranging impacts.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Chapter Overview

This chapter presents summary of the key findings, conclusions, and recommendations derived from the research. The conclusions are based on the specific objectives of the study and reflect the findings obtained from the study. Additionally, recommendations are provided based on the findings, aiming to address the identified issues and provide actionable steps for improvement.

5.2. Summary of the Findings

The finding on the household monthly incomes among residents surrounding Burunge WMA reveals that 18.9% of households are living in extreme poverty, 14.2% are in moderate poverty, and 21.8% are vulnerable to poverty. In contrast, 45.1% of households are categorized as non-poor. The analysis of secondary data showed that there was a general decrease in the number of poaching incidences from 25 cases in 2019 to 18 cases in 2023, representing an overall reduction of 28% over the five-year period. Further, the findings indicate that awareness of poaching activities among residents surrounding Burunge WMA is divided, where 42.5% of respondents being aware of poaching activities in the area, while 57.5% are not aware.

Among those who reported to be aware of poaching activities, most of individuals (94.5%) admitted to have been involved in such activities at least few times a year. The major reasons for poaching activities in Burunge WMA includes poaching of

bush meat for commercial purposes (46.7%) and subsistence (38.3%), poaching for traditional medicine (7.3%), ornaments (4.7%), and other wildlife products (3.1%). The statistical analysis using Chi-square test reveals a significant association between household income poverty levels and various reasons for poaching.

The statistical analysis using the Chi-Square test showed a strong relationship between household income poverty levels and engagement in poaching activities ($\chi^2 = 33.452$, df = 3, $p<0.05$). The study indicated that inadequate education and skills (25.2%), lack of alternative livelihoods (21.0%), economic desperation (20.6%), debt and financial pressure (16.9%), dependence on natural resources (6.5%), limited access to markets (6.5%), and social norms (3.3%) significantly contribute to poaching activities among residents surrounding Burunge WMA.

5.3. Conclusion

This study concludes that household income poverty is prevalent among residents surrounding Burunge WMA. A significant portion of households are living in extreme or moderate poverty, while others are vulnerable to poverty. Only less than half of households are classified as non-poor. The primary reasons for wildlife poaching activities in Burunge WMA are the poaching of bush meat, both for commercial purposes and subsistence. These two factors account for the majority of poaching cases, demonstrating that economic motivations and the need for food are the driving forces behind poaching. Additionally, poaching for traditional medicine, ornaments, and other wildlife products, though less common, also contribute to poaching activities.

The study concludes that there is a strong relationship between household income poverty and poaching activities in Burunge WMA. Income poverty, characterized by inadequate education, lack of alternative livelihoods, economic desperation, and financial pressure, significantly drives individuals to engage in poaching activities.

5.4. Recommendations

a) Recommendations for Ministry of Natural Resources and Tourism

Strengthen Community Education Initiatives: The Ministry should increase consistent and culturally relevant community awareness campaigns to educate local populations on poaching laws, wildlife conservation, and the benefits of protecting biodiversity. These programs should involve local leaders to enhance outreach and impact.

Provision of Alternative Livelihood Opportunities: The government, through its ministries and agencies (e.g., the Ministry of Natural Resources and Tourism), Burunge WMA, should design and fund programs that offer alternative income-generating activities. This can include promoting sustainable agriculture, livestock keeping, and other eco-friendly economic ventures.

b) Recommendations for Burunge WMA Authorities

Increase Surveillance and Anti-Poaching Efforts: Burunge WMA should collaborate with law enforcement agencies and increase utilization of modern technologies, such as drones and GPS trackers, to monitor wildlife and detect poaching activities. They should also continue to involve local communities more in patrols and monitoring efforts to strengthen community engagement in conservation.

c) Recommendations for NGOs and Development Partners

Support Livelihood Diversification Programs: NGOs, CBOs and development partners should prioritize investing in initiatives that provide alternative sources of income for local communities. These initiatives could include eco-tourism projects, sustainable agriculture, or vocational training, which offer practical alternatives to wildlife exploitation.

5.5. Areas for Further Research

Future research should adopt a more comprehensive approach to assessing household income poverty by incorporating a wider array of indicators. For example, aspects such as asset ownership, access to education, availability of employment opportunities, and local economic conditions can greatly affect a household's economic situation and their choices regarding livelihoods. By exploring these additional dimensions, researchers can gain a clearer insight into how different aspects of poverty contribute to the likelihood of engaging in poaching activities.

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APPENDICES

Appendix 1: Questionnaire for the heads of households

INFLUENCE OF HOUSEHOLD INCOME POVERTY ON THE PERSISTENT POACHING ACTIVITIES IN BURUNGE WILDLIFE MANAGEMENT AREA IN BABATI DISTRICT

Greetings! My name is **Beatrice Modest,** pursuing a degree of Master of Arts in Natural Resource Assessment and Management (MANRAM) at Open University of Tanzania. I am doing a research project with the objective of assessing the **Influence of Household income poverty on the persistent poaching activities in Burunge wildlife management area in Babati District.** This is an academic research for a partial fulfilment of above mentioned degree program. All collected information will be entered into computer with only the participant identification number. Confidentiality will be adhered to, and no unauthorized persons will have access to the data collected.

SECTION ONE: DEMOGRAPHIC INFORMATION OF RESPONDENTS

(Put tick (√) where applicable)

1. Name of respondents' village …….

2. Sex of respondent:

a) Male ( )

b) Female ( )

3. Age of respondent (***in years***):

a) Below 18 ( )

b) 18-25 ( )

c) 26-35 ( )

d) 36-45 ( )

e) 46-60 ( )

f) Above 60 ( )

4. Marital status of respondent:

a) Single ( )

b) Married ( )

c) Divorced ( )

d) Widow ( )

5. Education level of respondent:

a) No formal education ( )

b) Primary education ( )

c) Secondary education ( )

d) Certificate /Diploma ( )

e) Degree graduate ( )

6. Occupation of respondent:

a) Livestock keeping ( )

b) Farming ( )

c) Business ( )

d) Employment ( )

e) Other (*specify*)…….. ( )

7. Respondent's household size is ……..persons

SECTION TWO: HOUSEHOLD INCOME

8. Sources of Income: a)……

b)……

c)……

9. Total household income /monthly is TZS ……..….

10. The household income/monthly derived from livestock keeping is TZS……

11. The household income/monthly derived from farming activities is TZS…….

12. The household income/monthly derived from business is TZS……

13. The household income/monthly derived from employment is TZS…….

14. Household income from other sources: TZS .....

15. What are the average monthly expenditures of the household on essential items?

a) Food: TZS…….

b) Clothing: TZS …….

c) Shelter: TZS…….

SECTION THREE: WILDLIFE POACHING ACTIVITIES IN BURUNGE WMA

16. Are you aware of poaching activities in Burunge WMA? Yes ( ) / No ( )

17. Have you ever engaged in extracting resources (poaching activities) from Burunge WMA? Yes ( ) / No ( )

18. Which resources and for what purpose did you extract from Burunge?

a) …….

b) ……..

c) …….

d) ……..

19. What are your views on the penalties for poaching? Are they fair and effective?

Yes ( ) / No ( ) …… …… ……

…….…… ……

20. Do cultural practices or traditions in your community involve the use of wildlife?

Yes ( ) / No ( )

21. Do you feel that income from poaching is essential for your household's survival?

Yes ( ) / No ( )

22. Do you believe that reducing poaching would benefit your community?

Yes ( ) / No ( ) If yes, how? …… ……

…… ……

23. How often do poachers engage in poaching activities in Burunge WMA?

a) At least a few times a year ( )

b) At least once a month ( )

c) Several times a month ( )

d) Once a week ( )

e) Several times a week ( )

f) Every day ( )

24. Which are the reasons for poaching in Burunge WMA among local communities? (*tick all which apply*)

a) Poaching of bush meat for subsistence ( )

b) Poaching of bush meat for commercial ( )

c) Poaching for traditional medicine ( )

d) Poaching for ornaments ( )

e) Poaching of others wildlife products ( )

25. Are the local communities involved in anti-poaching activities in Burunge WMA?

a) Yes ( )

b) No ( )

26. If QN 25 is Yes, how are the local communities involved in anti-poaching activities? *(tick all which apply)*

a) Employment as rangers and scouts ( )

b) Joint patrols ( )

c) Community-based wildlife management ( )

d) Education and awareness programs ( )

e) Alternative livelihood programs ( )

f) Participatory monitoring and reporting ( )

g) Involvement in decision making ( )

h) Use of traditional knowledge ( )

SECTION FOUR: RELATIONSHIP BETWEEN HOUSEHOLD INCOME POVERTY AND POACHING ACTIVITIES

27. How does household income poverty influence poaching activities in Burunge WMA? *(tick all which apply)*

a) Economic desperation ( )

b) Lack of alternative livelihoods ( )

c) Inadequate education and skills ( )

d) Dependence on natural resources ( )

e) Social norms ( )

f) Debt and financial pressure ( )

g) Limited access to markets ( )

h) Health and medical expenses ( )

i) Other (specify) ( )

28. What is relationship between household income poverty and the persistent poaching activities in Burunge WMA *(tick all which apply)*

a) Poaching cause loss of biodiversity ( )

b) Poaching cause loss of tourist attractions ( )

c) Poaching cause loss of employment ( )

i) Poaching cause increase in illegal wildlife trafficking ( )

j) Poaching cause loss of biodiversity ( )

k) Other (specify) ( )

29. What measures should be taken to address wildlife poaching activities in Burunge WMA?

a) Provide alternative livelihood opportunities ( )

b) Support sustainable agriculture programs ( )

c) Promote eco-tourism and community-based tourism ( )

d) Implement microfinance and small business loans ( )

e) Enhance vocational training and education ( )

f) Develop local craft and handicraft markets ( )

g) Support community-owned conservation enterprises ( )

h) Improve access to markets and fair trade ( )

i) Facilitate community revenue sharing from conservation activities ( )

******** THE END ********

Appendix 2: Interview Guide for Key Informants

1. How can you describe the level of household's income poverty among local communities bordering Burunge WMA?
2. What are the primary sources of income for households in this community? Determine the economic dependence on natural resources and alternative livelihoods.
3. Do cultural practices or traditions in your community involve the use of wildlife?
4. Do you think poaching is justified under certain circumstances? If so, what are they? Understand the moral and ethical perspectives on poaching.
5. How do community leaders or elders view poaching and wildlife conservation? Understand the influence of local leadership on community attitudes towards poaching.
6. Are there any community initiatives to protect wildlife or promote alternative livelihoods? Identify existing local efforts and potential allies in conservation.
7. How effective do you think local authorities are in controlling poaching activities?
8. What are your views on the penalties for poaching? Are they fair and effective? Assess perceptions of law enforcement and deterrence.
9. What are the reasons for poaching activities in Burunge WMA?

   Probe: Who (sex, age groups, ethnic groups, villages) are doing them? How are they done? For what purpose?
10. What are the main drivers / factors for engaging in poaching activities in Burunge WMA?

Probe: Why are those drivers? How?

11. How does household income poverty influence poaching activities in Burunge WMA?
12. What are the consequences of engaging in persistent poaching activities in Burunge WMA?

    Probe: What is the level/magnitude of each consequence?
13. What measures should be taken to address wildlife poaching activities in Burunge WMA?

    Probe: By who? How?

Appendix 3: Chi-Square analysis of household monthly income levels (TZS) and Occupation

Household monthly income levels (TZS)	Occupation						Chi-square results		
	Livestock keeping	Farming	Fishing	Business	Employment	Mixed	χ^2	df	Sig.
Very Low Income	10	5	6	5	3	11	90.549	20	.000
Low Income	51	25	4	5	3	35			
Moderate Income	16	7	11	10	11	65			
High Income	16	5	1	13	12	39			
Very High Income	0	5	0	0	1	11			

Appendix 4: Chi-Square analysis of Household monthly expenditure (TZS) and Occupation

Household monthly expenditure (TZS)	**Occupation**						**Chi-square results**		
	Livestock keeping	Farming	Fishing	Business	Employment	Mixed	χ^2	**df**	**Sig.**
Expenditure for food	93	47	22	33	30	161	283.963	85	.000
Expenditure for clothes	84	45	22	33	30	156	178.687	60	.000
Expenditure for shelter	23	10	10	13	2	9	80.783	20	.000

Appendix 5: Chi-Square analysis of Household income poverty levels and Occupation

Household income poverty levels	Occupation						Chi-square results		
	Livestock keeping	Farming	Fishing	Business	Employment	Mixed	χ^2	df	Sig.
Extreme Poverty	34	7	8	5	4	15	103.276	15	.000
Moderate Poverty	18	20	2	5	0	10			
Vulnerable to Poverty	22	5	7	3	8	39			
Non-Poor	19	15	5	20	18	97			

Appendix 6: Chi-Square analysis of household income poverty levels and frequency of poaching activities

Household income poverty levels	Frequency of poaching activities			Chi-square results		
	At least a few times a year	At least once a month	Several times a month	χ^2	df	Sig.
Extreme Poverty	65	0	0	67.681	6	.000
Moderate Poverty	40	5	10			
Vulnerable to Poverty	79	0	5			
Non-Poor	159	0	0			

Appendix 7: Chi-Square analysis of household income poverty levels and reasons for poaching activities

Reasons for poaching activities		Household income poverty levels				Chi-square results		
		Extreme Poverty	Moderate Poverty	Vulnerable to Poverty	Non-Poor	χ^2	df	Sig.
Poaching of bush meat for commercial purposes	No	27	15	18	37	7.582	3	.005
	Yes	46	40	66	137			
Poaching of bush meat for subsistence	No	42	20	27	60	13.881	3	.003
	Yes	31	35	57	114			
Poaching for traditional medicine	No	61	55	70	155	11.016	3	.012
	Yes	12	0	14	19			
Poaching for ornaments	No	67	55	68	167	23.654	3	.000
	Yes	6	0	16	7			

Appendix 8: Chi-Square analysis of household income poverty levels and engagement in poaching activities

Household income poverty levels	Engagement in poaching activities		Chi-square results		
	No	Yes	χ^2	df	Sig.
Extreme Poverty	67	6	33.452	3	.000
Moderate Poverty	35	20			
Vulnerable to Poverty	74	10			
Non-Poor	161	13			

Appendix 9: Research Clearance

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

THE OPEN UNIVERSITY OF TANZANIA

Ref. No OUT/PG202186094 **22nd May, 2024**

District Executive Director (DED),
Babati District Council,
P. O. Box 400,
MANYARA.

Dear Director,

RE: RESEARCH CLEARANCE FOR MS. BEATRICE MODEST, REG NO: PG202186094

2. The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

3. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Ms. Beatrice Modest, Reg.**

No: PG202186094), pursuing **Master of Arts in Natural Resource Assessment and Management (MANRAM).** We here by grant this clearance to conduct a research titled **"Influence of Household Income Poverty on the Persistent Poaching Activities in Burunge Wildlife Management Area in Babati District"**. She will collect her data at your area from 23rd May to 30th June 2024.

4. In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

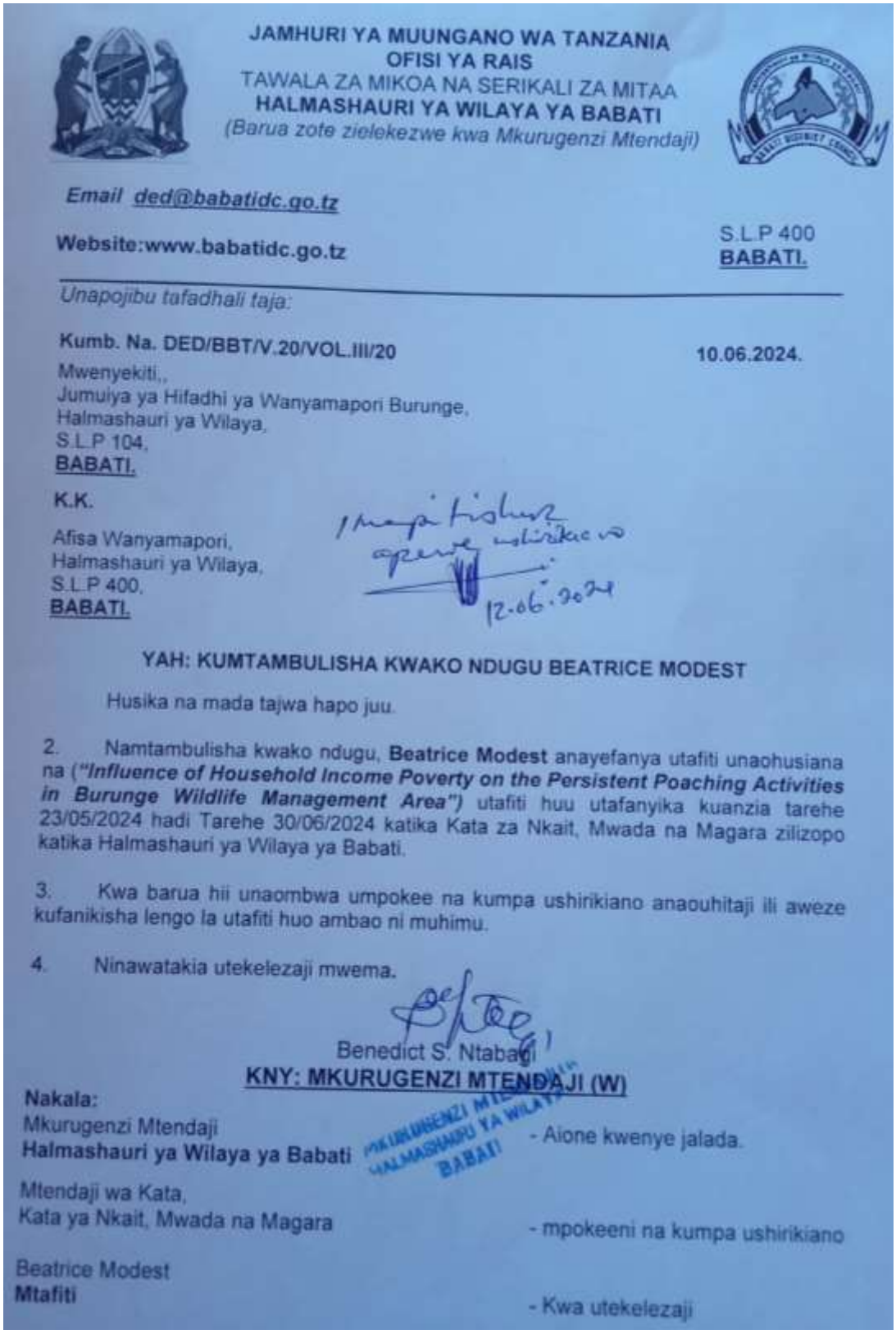
Yours sincerely,

THE OPEN UNIVERSITY OF TANZANIA

Prof.Gwahula Raphael Kimamala

For: VICE CHANCELLOR

Appendix 10: Research Permit



JAMHURI YA MUUNGANO WA TANZANIA
OFISI YA RAIS
TAWALA ZA MIKOA NA SERIKALI ZA MITAA
HALMASHAURI YA WILAYA YA BABATI
(Barua zote zielekezwe kwa Mkurugenzi Mtendaji)

Email ded@babatidc.go.tz

Website:www.babatidc.go.tz

S.L.P 400
BABATI.

Unapojibu tafadhali taja:

Kumb. Na. DED/BBT/V.20/VOL.III/20 **10.06.2024.**

Mwenyekiti,,
Jumuiya ya Hifadhi ya Wanyamapori Burunge,
Halmashauri ya Wilaya,
S.L.P 104,
BABATI.

K.K.

Afisa Wanyamapori,
Halmashauri ya Wilaya,
S.L.P 400,
BABATI.

Mnapitishwa
apewe ushirikiano
12.06.2024

YAH: KUMTAMBULISHA KWAKO NDUGU BEATRICE MODEST

Husika na mada tajwa hapo juu.

2. Namtambulisha kwako ndugu, **Beatrice Modest** anayefanya utafiti unaohusiana na (***"Influence of Household Income Poverty on the Persistent Poaching Activities in Burunge Wildlife Management Area"***) utafiti huu utafanyika kuanzia tarehe 23/05/2024 hadi Tarehe 30/06/2024 katika Kata za Nkait, Mwada na Magara zilizopo katika Halmashauri ya Wilaya ya Babati.

3. Kwa barua hii unaombwa umpokee na kumpa ushirikiano anaouhitaji ili aweze kufanikisha lengo la utafiti huo ambao ni muhimu.

4. Ninawatakia utekelezaji mwema.

Benedict S. Ntabagi
KNY: MKURUGENZI MTENDAJI (W)

Nakala:
Mkurugenzi Mtendaji
Halmashauri ya Wilaya ya Babati - Aione kwenye jalada.

MKURUGENZI MTENDAJI
HALMASHAURI YA WILAYA
BABATI

Mtendaji wa Kata,
Kata ya Nkait, Mwada na Magara - mpokeeni na kumpa ushirikiano

Beatrice Modest
Mtafiti - Kwa utekelezaji